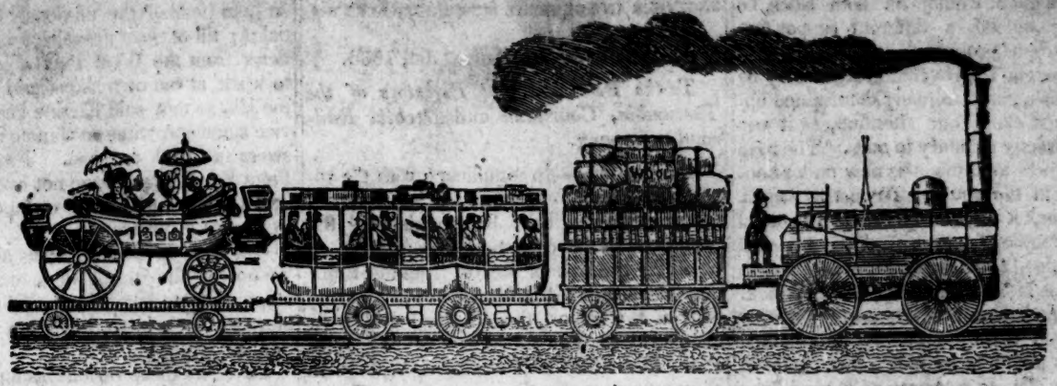

AMERICAN RAILROAD JOURNAL,

AND ADVOCATE OF INTERNAL IMPROVEMENTS.

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ERICAN RAILROAD JOURNAL.

NEW-YORK, DECEMBER 31, 1836.

We beg leave to return thanks to those lemen who have already remitted the scription for 1837.

The small sum due to us is but a trifle n each subscriber, while to us it consti-s the whole amount of our means. May therefore be permitted to urge upon our ers, the necessity of prompt payment. s is the last number of the year 1836.

D AND FOURTH ANNUAL REPORTS OF HE OFFICERS OF THE TUSCUMBIA, COURT-AND AND DECATUR RAILROAD COMPANY.

COURTLAND, August 1st, 1836.

o the Stockholders of the Tuscumbia, rtland and Decatur Railroad Company.

GENTLEMEN:—The anxiously looked for, ort of the Engineer has been received. together with that of the Treasurer, is with transmitted.

The Engineer has made out a full and specific account of the cost of the Road, in its several items; the cost of the various property of the Company appertaining to the Road, and of our receipts and expenditures from the time that operations were first commenced, up to the present. It appears that, notwithstanding, the numerous disappointments and misfortunes that have, from time to time, befallen the Company, the total amount of receipts has exceeded the total amount of expenditures, by a sum a little upwards of twenty thousand dollars, or nearly five per cent. upon our investment for the entire period, since the Road first began to be used. This, though a small profit, should nevertheless, afford us much encouragement, when we take into consideration the adverse circumstances under which it has accrued. In the first instance, we were either disappointed in the receipt of Engines contrated for, or else when received, they were found to be unfit for the purpose for which they were intended. By this means we were, in the first place, hindered in the execution of our business, in the second, lost the confidence of the public, who, in consequence refused to give us employment, and, thirdly, were put to much actual expense in making our Engines suitable instruments for the purposes of the Company. In addition to these considerations, the Engineer assures us, upon the most satisfactory data, that could Locomotive power have been exclusively employed from the first, the expenditures of the Road up to the date of the Report, would have been diminished at least ten thousand dollars. Such diminution of expenditure would have raised the sum of profits to 30,000 dollars, or near seven per cent. upon the investment, up to this date. From all the information derived from the Reports of the different departments, we may safely predict the future prosperity of the Company. We may rest assured that our expenditures will be continually decreasing while our receipts will be continually increasing. We are now fully prepared to fabricate for ourselves every species of machinery relating to the Road, having for our chief workman, an English-bred mechanic of the first reputation. The embankment of the Road, which is now the principal object of repairs, when consolidated by time, will have been rendered almost independant of repairs.—The labor we employ must necessarily grow cheaper as laborers multiply and population becomes more dense. While the increase of population, productive labor, commerce, manufactures, agriculture, wealth and travel, must greatly advance the business and emoluments of the Road. Thus while time will operate progressively, to reduce expenditure, on the one hand, it will progressively enlarge our receipts, upon the other. And there cannot exist a doubt, that the ratios of these two progressions will be sufficient, speedily, to ensure an income that ought to satisfy the desires of the Company.

It is a fortunate circumstance for the Company, that their improvement has been in advance of all schemes for similar improvement in this region of the United States. It will, on this account, tend to give direction to subsequent improvement in the same region.—There was much talk in South Carolina of connecting their great Western Railroad with this, and although the plan was eventually abandoned, yet it is worthy of remark and full of encouragement for us, that our comparatively small establishment, should have been a matter of grave deliberation, in determining the route of that stupendous High Way. A connexion, however, will ultimately, take place. A South-Western branch must strike off from some point on the Charleston and Cincinnati Road, and will certainly have its origin on this side of the Mountains, as it is not to be supposed that a company would incur the expense of cutting a second pass through the mountains, when one already existed. This branch will have its direction through the Tennessee Valley, and must either be connected with our Road, or take a parallel route, and come in competition with it. But as competition would operate injuriously on both contending interests, nothing is more evident, than that co-operation

and coincidence would, on both sides, be preferred; indeed, a different supposition would be preposterous in the extreme.

The Georgia Improvement which may be regarded as a matter already determined upon, will next claim our attention, as it will become directly tributary to ours. The roap from Augusta to Athens is now under contract, and in the course of construction.—From Athens it will *double* (to use a nautical term) the Southern extremity of the Alleghany Mountains, and terminate at a point on the Tennessee River a little below the Suck. The intermediate link of connexion between our road and this will assuredly be supplied as soon as found to be called for. Indeed, we already have a certainty of a road from Decatur to Huntsville or some eligible point in the county of Madison.

The contemplated road which is to connect the city of Mobile with the navigable waters of the Tennessee River, becomes a third guarantee of our future prosperity; and I am happy in being able to assure the company, upon the most satisfactory information, that it will be entirely in our power to supply the conditions, upon which this road would be made to intersect ours at a point a little to the east of Courtland.

These three stupendous improvements are to pour their trade and travel along the channel of our road, into the great valley of the Mississippi.

Let us suppose the Charleston and Cincinnati Railroad to be carried into execution; and also the projected roads in Virginia, running towards the North and towards the South, through the towns of Lynchburg and Abington, to the junction of the French Broad and Nolichuckey rivers; and it is evident that the vast majority of the travel from the States of South and North Carolina, from Virginia, Maryland, Delaware, and New-Jersey, and a great portion of that from Pennsylvania, New-York and the New-England States, with their great commercial and manufacturing cities, in short from the Old States generally to the New, will direct its current along our own high-way, and down the Tennessee river and Nashville and New-Orleans Railroad into the great emporium of the West and South-West.

The passage through the Alleghany and Cumberland Mountains will be in the nature of a great Sea-port—where the commercial and social intercourse of two connecting regions will be concentrated—and it appears to be our good fortune to occupy, as it were, the focus in point of position.

The Georgia Road, too, will render heavy contributions, and that from Mobile will deliver its burdens at a central point, to pass along our Eastern or Western division, according to particular destination.

Let us, then, continue to cherish those sanguine anticipations which we have all along indulged, and instead of becoming discouraged, rather let it be our chief concern, to perfect and mature our work, and be prepared in the resources that may be put in requisition for the construction of a *second track*, to meet the demands that may in future be made upon us.

Respectfully submitted,

BENJAMIN SHERROD, President of the Tuscumbia, Courtland and Decatur Railroad Company.

ENGINEER AND GENERAL SUPERINTENDENT'S OFFICE.
TUSCUMBIA, August 1st, 1836.

To the President and Directors of the Tuscumbia, Courtland and Decatur Railroad Company.

GENTLEMEN:—In compliance with the regulations of the Company, I beg leave to submit the following brief Report, showing the operations in this department, from the period of the last annual Report from the Engineer department 4th March 1834. At the date of that report, the Railroad had been completed to Town Creek, say 14¾ miles above Tuscumbia, and was in rapid progress of construction, for the remaining 8 miles to Courtland. The space between Courtland and Decatur had just been let to contract, and the contractors were beginning upon the work. By 4th July the road was completed, and opened as far as Courtland. And on the 15th December of the same year, [1834] the work was accomplished to the Town of Decatur, and the Locomotive with her train of Cars, passed through the whole extent of the road for the first time. Thus it will be seen that 28¼ miles of the road were accomplished in a little over 9 months.

Before the road was quite completed, business began to accumulate. In anticipation of that event large quantities of Merchandize, destined for the upper Tennessee, had been sent to Courtland, to remain until a thorough transit should be afforded. But unfortunately for the Community as well as the Company we had been disappointed in the receipt of Cars as well as Locomotives. Two Locomotive Engines had been purchased at the North, to be delivered to us early in the season. One of which was received in February, 1835, without tender-car or tank, both of which was supplied, after some loss of time, at our own works; but when the Engine came to be put on the road it was found not to answer the purpose, being deficient in almost every important respect. This Engine had been purchased second handed from the Philadelphia, Germantown and Norristown Railroad Company—an article which they had tried to their own satisfaction, and were no doubt, pleased at the opportunity of disposing of it. The other Engine did not arrive until about the 1st of January—this Engine was made at the West Point Foundry, New-York, and had the appearance of a good article, and indeed performed well for a few weeks—but owing to a defect in the castings of the cylinders, as well as a bad arrangement in the slides that carry the crossheads, one of the cylinders gave way on the 15th of June, immediately under the exhaust passage, bursting open nearly its whole length; the metal in that part being only about an eight of an inch in thickness. The Engine of course was perfectly useless until new cylinders could be procured. Not being prepared with tools at our own works to remedy the difficulty. I wrote to Mr. Kemble, the manager of the West Point Foundry, advising him of the deficiency of the Engine, and requesting that he would, with all practicable despatch, make a new pair of cylinders, as well as slides, and forward them to us. Which he promised to do. We waited on his promise till quite late in the fall, say October or November, expecting daily to hear of the anxiously looked for ticles; till at last despairing of any fur news from the West Point Foundry, we to work at our own shops and accompli the job, so that said Engine has been in vice since sometime in January last, and swers a good purpose. From the W Point Foundry we have not even to this heard a word of excuse or apology for treatment given us.

Our Car establishment was also extre limited at the period of opening the r amounting to but about 15 lumber, an pleasure cars, instead of from 50 to 75 number required.

Owing to these various disappointmen regard to Motive power, we were comp to resort to the only alternative left t horses, to do the business. And in the of this kind of Power the want of car much more sensibly felt than it would been with Engines, owing to the limited s of horses; besides this the Railroad ha been just completed as the winter set in, the horse path not being gravelled, the very soon became almost impassable horses. In consequence, it was entirel yond our means to perform the transpo tion that was offered to us during the w of 1834 and '35, and a large portion o business had to seek another channel. was not all, it effected very materially ou siness for the succeeding year. The c munity who had been disposed to patron from the first, not aware of the true ca producing the inability of the Compa perform what had so confidently been pected from them, became soured in feelings towards the Railroad, and deter not to encourage the Company any fu until it should prove itself fully adequa the transportation of all the freights should be offered. By about the 1st 1835 the number of Cars had been s augmented that we began to be able to up with the business; every exertion continued to be made, to increase the ber of Cars, and at the same time two Locomotive Engines were ordered, one M. W. Baldwin of Philadelphia, an other from Liverpool. The former placed upon the road about the 1st o last, but the latter has not yet arrived, as we understand to the great number ders on hand before ours. It is, how gratifying fact to state, that since abo 1st July 1835, we have had the capa accomplish the business that was offer though at an immense expense, owing mixture of motive power, used upon th From the period last above mentioned this date I presume about ⅓ to ½ of th ness was done by horses, and the rem by Locomotives, to viz: One small E the "Fulton," the "Comet," since Ja last, and the "Triumph," since about of June. Since the latter Engine was on the road no horse power has been transportation between Tuscumbia an catur. I say we were able to do th ness that was offered, and I confiden lieve we had the capacity to do dou amount that was presented since Oct November last, and our car establi having been continually augmenting, perfectly assured, that although the b the ensuing year, is expected to be ful

ble what it was the last 12 months, yet we shall be enabled without difficulty to give it despatch.

The following statement will exhibit the investments of the Company:—viz.

Cost of Railroad,	$218,566	49
Property at Tuscumbia Landing,	44,667	03
Railroad works at Tuscumbia,	6,929	72
Property at Tuscumbia,	9,667	97
Property at Leighton,	2,822	90
Property at Jonesborough,	615	18
Property at Courtland,	3,369	82
Property at Hillsborough,	737	17
Property at Fennell's turnout,	213	69
Property at Decatur,	30,286	73
Locomotives,	26,189	71
Horses,	4,510	00
Cars,	21,676	00
Negroes,	9,575	00
Instruments,	394	25
Real Estate,	1,683	34
Railroad Iron, on hand,	183	75
Railroad Timber, on hand,	285	52
Lumber,	884	91
Office Furniture,	346	07
Moveable property,	2,364	50
Harness,	532	00
Stone Coal,	7,875	51
Stock on hand, in Smith shop and Foundry,	27,943	16
Stock on hand, in Car shop,	2,705	38
Casting on hand,	1,167	14
Provender on hand,	491	21
Fuel on hand,	434	00
Unguent on hand,	610	95
Provision on hand,	696	52
Clothing on hand,	466	09
Total,	$428,891	71

The cost of the Railroad is composed of the following items:—viz:

Timber account,	$48,395	89
Iron,	38,450	39
Graduation,	42,372	68
Construction,	29,406	12
Right of Way,	11,100	45
Masonry,	3,549	77
Bridging,	4,523	75
Grubbing and chopping,	3,242	22
Pitching,	655	41
Extra work,	2,362	06
Turn outs,	1,003	23
Horse path,	4,360	33
General incidental expenses,	3,566	47
Improvements since the road was opened, including several turn outs, the inclined plane at Decatur, &c., &c.	9,538	49
Engineering account,	15,950	23
Total,	$218,566	49

Property at Tuscumbia Landing consists 4 acres of land, wharves, warehouses, machinery, offices, &c.

Railroad Works at Tuscumbia consist of lot of ground, occupied by Company's ops and foundry.

Property at Tuscumbia consists of seve- lots of ground, warehouses and offices Tuscumbia.

Property in Decatur consists of wharves, arehouses, machinery, and all real estate the company at that point.

Property at Leighton, Jonesborough, ourtland, Hillsborough and Fennell's turn out, consists of warehouses, water-stations, stables, &c., at those respective places.

Locomotives embrace the locomotive establishment, consisting of four locomotive engines, viz: the "Fulton," "Pennsylvania," "Comet" and "Triumph.

The "Fulton," made by Edward Bury, of Liverpool, stands charged at $4,915 04. She was first put upon the road about the 1st of June 1834, and has been a useful engine for her class. She is small, weighing only about 5 tons; 8 inch cylinders, and 16 inch stroke, driving wheels 4½ feet diameter.

The "Pennsylvania" is the engine (before spoken of) which was bought from the Philadelphia, Germantown and Norristown Railroad Company, and stands charged at $5,880 37. This engine has been of no service on the road; weighs about 9 or 10 tons, and about ¾ of her weight on the driving wheels, which renders it altogether too heavy for the good of the road; her boiler is also deficient in fire-surface, so that she is not capable of generating a sufficiency of steam. Her cylinders 10 inches diameter, 18 inches stroke, driving wheels 4½ feet in diameter. After a trial on the road with this engine, she was taken off and placed along side of the machine shop, where she has been used to this day, to drive the machinery about the works. A common engine is being put up to answer this purpose, and as soon as this is effected, we design taking her to pieces, enlarging the boiler, and putting her on eight wheels, carrying the front part on four small wheels, (two and a half feet diameter,) and using four adhesion or driving wheels; by means of outside cranks and connection; when this is accomplished, she will without doubt, answer a good purpose, and will be easy on the road.

The "Comet" from the West Point Foundry Association, New-York, stands charged at $7,959 82; weighs about 7½ or 8 tons; 10 inch cylinder, and 20 inches stroke; driving wheels 4½ feet diameter. This engine has been of very little use to the Company, until about the first February last, in consequence of the bursting of one of her cylinders, as before described, (in the beginning of this report.) When she was first put on the road she had four wheels of equal diameter, (4½ feet,) but as she had no connection between the hind and fore wheels, the large wheels forward proved to be a disadvantage, and we dispensed with them, and put the forward part of the engine on a truck car with four wheels, 2 feet 6 inches diameter, which causes her to take the curves much better and is found to answer an excellent purpose. This engine is used as a freight engine, and performs well.

The "Triumph," made by M. W. Baldwin, of Philadelphia, cost $7,091 56. She was put on the road about the first of June last, and performs well. This engine is on six wheels; weighs 6½ tons (without water;) 10½ inches cylinder, 16 inch stroke, driving wheels 4½ feet in diameter. She is remarkable for the great simplicity of her gearing, and at the same time, for the strength of all her parts. She has been in active service ever since her arrival, and the cost of repairs charged to her, to this date, only amount to $1116. Being placed on six wheels, (and the weight nearly equally divided,) she is very easy on the road, but the want of sufficient adhesion, (in slippy weather,) through her driving wheels is frequently felt, although an apparatus is attached by means of which part of the weight of the tender is brought to bear on the driving wheels. Indeed, the want of adhesion between the driving wheels and the rails, in certain states of the weather, is a deficiency common to all engines, and a plan to obviate this has occupied our attention for some time, and a simple apparatus, which we have in contemplation, is confidently believed, will in a great degree, if not wholly remove this difficulty. The plan proposed is this:—Let a sort of hopper, (to hold a gallon or so,) be arranged just forward of the driving wheels, and above the frame of the engine, from which a tube will be projected downwards to within a small distance of the face of the rail. The hopper being filled with dry sand, will feed through the tube upon the rail. A cock, or regulator will be constructed in the tube to allow the sane to run in such quantities as may be desirable, or shut it off entirely; for want of sand, water may be used—as it is a fact well known, that the adhesion is quite as good with a perfectly wet rail as when perfectly dry.

The account of real estate, embraces such real estate as is not attached to a particular station, in connection with the road; and consists of the following, viz:

Lot Nos. 15 and 16 as laid off in the north half of section 5, township 4, range 11; each 20 acres, at $20 per acre,	$800	00
Six tracts of land, entered by the Company, 19th December, 1833, at Huntsville, being timbered, and situated contiguous to the Railroad, between Courtland and Decatur,	600	54
Lands entered at the Land Office at Courtland, about the same time,	175	30
A tract of land above Moulton, containing stone-coal,	50	00
Two acres of land at Deering's turn out, (not improved.)	57	50
	$1,683	34

Moveable property consists in tools and floating property of all kinds, not attached to a particular station, or property on the road. All the other accounts, comprising the investments of the company, explain themselves.

The receipts of the Company up to this date, as per Agent's reports, amount to $110,312 72.

Of which amount was received for transportation, from the beginning up to the 1st of August, 1835,	$25,680	27
From passengers for same period,	11,403	71

Warehouse commission for do.	11,723	86
General commission do. do.	8,398	86
Total up to 1st Aug. 1835,	$57,206	70
From 1st August 1835, up to date—		
For transportation,	$21,840	09
From passengers,	17,045	26
Warehouse commissions,	2,544	38
General commissions,	11,676	29
	53,106	02
Profits have also been derived from the following sources, viz:		
Smith shop and foundry,	$5,098	59
Carriage shop,	2,701	02
Negro property,	2,503	10
Real estate,	2,225	56
Horse property,	283	25
Sundries,	1,909	09
	14,720	61
Total,	$125,033	33
The expenses from the beginning of the business upon the road to this date, are as follows, viz:		
Agency expenses,	$39,221	15
All other expenses,	65,118	39
	104,330	54
Profits,	$20,693	79
The items in the expense account are as follows, viz:		
Horse power up to 1st Aug. 1835,	$7,683	54
Locomotive power, do. do.,	6,671	79
Car establishment, do. do.,	6,094	90
Repairs,	2,933	21
Paid for 17,321 lbs. cotton burnt December 31st, 1834,	2,205	81
General expenses,	269	51
Agency expenses,	21,148	07
Total up to 1st Aug. 1835,	$47,006	83
Horse power from 1st Aug 1834, to date,	14,348	48
Locomotive power for same period,	6,450	15
Car establishment, do.,	3,386	69
Unguent account, do.,	1,716	33
General expenses, do.,	6,045	48
Agency expenses, do.,	18,073	08
Repairs of the road from beginning to date,	7,312	50
	57,332,71	
Total expenses to date,	$104,339	54

A very striking comparison is here presented in the items of Horse power and Locomotives. It is seen that the expense of the former, for the year ending this day amounts to $14,348 48, while the expenses of the latter, for the same period, amount to $6,450 15; and as has been already stated, one half, or two thirds of the business was done by locomotives. It is confidently believed that had the manager of the West Point Foundry made good his promise, (which he ought to have felt bound to do, by much above an ordinary motive,) so that the engine "Comet," could have been put to use in September or October last, it would have made a difference of $10,000, in the expense of motive power. Horses could have been dispensed with almost entirely. The expense of horse power when brought directly in competition with locomotives, and that under the most favorable circumstances, (to the former,) is much more expensive than the latter. But this difference is much increased on a line of Railroad where there is any fluctuation in the business to be done. Ours is peculiarly of this character; as the freight from below is principally brought up in large boats, it is necessary that we should have the capacity to transport almost the contents of a large steamboat in one single day, whilst there will be buf little doing till the next boat arrives. Under such circumstances, the Company being prepared to accomplish the maximum of business their power is idle during a considerable recess, but the expense, (if the power is by horses,) is constantly the same; whilst with locomotives, the power being provided for the maximum, it costs nothing during the recess, (except the interest on the capital invested;) because the engine laid up, the engineer who conducts her, takes his place in the shops of the Company and earns his wages there. In short, in the one case, the expense is directly in proportion to the business done, whilst in the other, it is in proportion of the maximum continued for every day in the whole season.

The expenses of the Company up to this time have certainly been very high; and the statement just made is intended to account for a part of this extraordinary expenditure. But this is not the only point in which a reduction is expected to be obtained Heretofore, and until quite lately, the labor required in loading and despatching goods from the Depot at the Tuscumbia Landing, has been about double of what it is hoped to be in future. Great improvements have been made at that Depot, in facilitating the loading and changing of cars, by means of cranes, turn-rounds. &c.

The inclined plane at Decatur, was not completed until last spring; so that all the freights for up the river had to be transferred by means of wagons and drays, from the head of the inclined plane to the landing at the river. All these difficulties being now obviated, we ought to expect to bring our expenses down to their lowest term during the ensuing year.

It has been before stated that the up freight upon the road is likely to be double what it was the past year. This I presume to be a fair calculation; and if an average crop of cotton shall be produced in the Tennessee Valley, the descending freight will be double or treble of what it was the past season; and the passenger account I feel safe in saying will be increased from 25 to 50 per cent. These are flattering prospects ahead, and I confidently believe they will be realized; and henceforth the stockholders may expect to receive at least fair, if not large dividends.

Very respectfully submitted,

DAVID DESHLER.

Engineer and General Superintendent T. C. and D. R. R.

RAILROAD TREASURER'S OFFICE.
TUSCUMBIA, August 1st, 1836.

To the President and Directors of the Tuscumbia, Courtland and Decatur Railroad Company.

GENTLEMEN—The following report will exhibit the situation of this department and the transactions that have transpired from the time of my appointment (11th April 1836) to this day.

In pursuance of resolutions of your Board, exertions have been continually making to get the old balances on stock liquidated; for this purpose, I obtained the services in part, of Mr. Walter Simpson, who proceeded upon that business, under written instructions, (a copy of which is appended to this report, marked No. 1.) He visited nearly every stockholder, who was accessible at the time; and succeeded in closing many of the accounts; but still a long list, amounting to a large sum of money, is standing open, which from one cause or other, could not, up to this date, be brought to a close. This business will continue to occupy my attention until all these accounts are closed. A list of stockholders is appended, marked No. 2, exhibiting the number of shares held by each individual, and the balance due from the same.

From this list, it also appears that the total orginal stock amounts to 3,063 shares, equal $306,300. Of which 258 shares have been transferred to the Company.

Of the 1,500 shares of the additional stock created in June last 1,155 shares have been subscribed, and secured (excepting $7,500) in the way proposed by the resolution of your Board. 345 shares remain to be subscribed: when this shall have been done the total capital stock in the Company will amount to 4,563 shares, equal to $456,300.

An account current, showing the receipts and disbursements in this department is annexed, marked No. 3; by which it appears thet the receipts from various sources have amounted to $207,396 76 cts. and the disbursements, to date, amount to $164,216 23 leaving a balance of cash in the Treasury on this day, of $43,180 50.

A general list of balances is also annexed from the books of this department. All of which is very respectfully submitted.

DAVID DESHLER, Treasurer,

Of the Tuscumbia, Courtland and Decatur Railroad Company.

A BRIEF ACCOUNT OF THE RAILROAD PROJECT, CONNECTING THE TENNESSEE RIVER, NEAR TUSCUMBIA, BELOW THE MUSCLE SHOALS, WITH THE SAME AT DECATUR, ABOVE SAID SHOALS, FROM THE BEGINNING OF SAID WORK, TO THE COMPLETION THEREOF.

On the 16th January, 1830, the act incorporating the Tuscumbia Railway Co-

pany, was passed by the Legislature of this State, authorizing a capital of $20,000 for the construction of a Railroad from the town of Tuscumbia, to the Tennessee River, a distance of two miles.

The stock was immediately subscribed by the citizens of Tuscumbia, and vicinity, and on the 1st day of May, 1830, the stockholders elected the first board of directors, consisting of 13 members, viz :—M. Tarver, President, A. Barton, James Elliot, B. Merrill, P. G. Godley, Jno. Kennedy, D. S. Goodloe, Jno. Sutherland, Jr., Jno. F. Pride, Jno. Haynie, Henry Cook, Thomas Keenan, and David Deshler, Directors.

Surveys were immediately instituted, and the route of the road determined. But owing to the want of power in the charter, to condemn ground for the right of way, and not being enabled to obtain that privilege by purchase, (the principal proprietor utterly refusing to sell the right of way to the Company,) nothing further was done until April, 1831, when the Company succeeded in purchasing the plantation which had presented the difficulty. Contracts for the grading, and for the various materials, were immediately entered into; and on the 5th day of June, 1831, the interesting operation of *breaking ground* took place. The work thus commenced, progressed without material interruption; and on the 12th day of June, 1832, the epoch of its completion was joyously celebrated.

A convention of delegates from the counties of Franklin, Lawrence, and Morgan, had been held at Courtland, on the 8th day of October, 1831, for the purpose of devising the best mode of operation to continue the Tuscumbia Railway to some eligible point on the Tennessee River, above the Muscle Shoals; and in pursuance of measures, then and there adopted, a charter was granted by the Legislature of the State, approved 13th January, 1832, incorporating the Tuscumbia, Courtland and Decatur Railroad Company,—fixing Decatur as the point of termination of the work above the Shoals.

On the 11th day of February, 1832, the Board of Directors (appointed by the charter,) met at Courtland, accepted the charter, and appointed their engineer, with instructions, forthwith to commence the surveys, with the view to the location of the road.

On the 1st Monday in March, 1832, a general meeting of the stockholders was convened at Courtland, to whom was submitted the results obtained by the surveys, so far as actually made; and an approximate estimate presented by the engineer, of the cost of the whole Road. At this meeting, a board of Directors was chosen, in pursuance of the charter, to serve for one year,—viz: Benj. Sherrod, President, H. W. Rhodes, J. T. Sykes, Thomas Hopwod, P. G. Godley, D. S. Goodloe, M. Tarver, B. Merrill, Joseph Trotter, W. Whitaker, Peter W. Taylor, William Leetch, and Sterling R. Cockrill, Directors; David Hubbard was appointed Secretary, and in April following, Jack Shackelford was appointed Treasurer of the Company.

In May, 1832, the graduation as far as Leighton, 10¾ miles, was put under contract, and in July, the construction for the same space was let. In October of the same year, the remaining space to the town of Courtland, (both grading and construction) was let to contract; and in January, 1834, (and soon thereafter,) the whole of the space between Courtland and Decatur was let out to contract, embracing the grading and construction of the Road.

The Road was completed and opened as far as Leighton, on the 20th day of August, 1833, to Courtland, on the 4th of July, 1834, and to Decatur on the 15th December, 1834.

At the second annual election, held at Courtland, on the 1st Monday in March, 1833, the following gentlemen were constituted a board for one year from thence, viz :—Benj. Sherrod, President, D. Hubbard, P. W. Tayler, D. S. Goodloe, M. Tarver, James Fennel, H. W. Rhodes, James T. Sykes, W. Leetch, James B. Wallace, B. Merrill, John L. McRae, and James Elliot, Directors; Jack Shackelford was continued as Treasurer, and D. G. Ligon was appointed Secretary.

At the third annual election, held on the 1st Monday in March, 1834, the following gentlemen composed the board to serve for one year, viz :—Benj. Sherrod, President, M. Tarver, James T. Sykes, D. S. Goodloe, H. W. Rhodes, James Fennel, James B. Wallace, James Elliot, B. Merrill, Birt Harrington, D. Hubbard, John L. McRae, and John Gregg, Directors; James Elliot was appointed General Superintendent and Treasurer, and Jack Shackelford was appointed Secretary.

At the fourth annual election, held on the 1st Monday in March, 1835, the following gentlemen were chosen, to serve for one year, and until their successors should be qualified, viz :—Benj. Sherrod, President, D. Hubbard, M. Tarver, Jack Shackelford, D. S. Goodloe, B. Merrill, James T. Sykes, H. W. Rhodes, James Fennell, John Gregg, James B. Wallace, James Elliot, and John L. McRae, Directors; Simon Jeffries was appointed Secretary; James Elliot was continued the Treasurer of the company. The duties of General Superintendent, were annexed to that of the Engineer. In April, 1836, Mr. Elliot resigned the office of Treasurer, and D. Deshler was appointed Treasurer of the Company.

The Engineer Department, was constituted as follows, viz :—

David Deshler, Chief Engineer from the commencement of the project to date.

F. H. Petrie was employed as Surveyor and draftsman from some time in February, 1832, to May of the same year.

John Taylor was employed as Assistant Engineer in May, 1832, and continued in the service of the Company to the completion of the road.

Franklin Crawford was employed as surveyor, for several months, in the fall of 1832, and again in the same capacity, during the fall and winter of 1833, and 1834; and from the 1st of February, 1834, to the completion of the Road, he was employed as assistant Engineer.

John Wilson was employed as assistant Engineer, from the 18th April, 1834, to the completion of the Road.

In October, 1832, Thomas Limrick was appointed General Agent of the company, to superintend the receiving and forwarding of goods and produce, at the Tuscumbia landing, and in the town of Tuscumbia, and to the current business upon the Road; which situation he has filled, up to this date.

James Fennel was appointed the agent of the Company at Decatur, and has filled that station, from the date of the opening the Road to the present time.

August 1st, 1836.

UNION CANAL.

The Annual statement of the Managers of the Union Canal Company, has been published. From it we learn that owing to the severity of last winter, the operations on the Canal were suspended for five weeks longer than during the preceding season. It was closed by ice on the 27th of November, and the navigation was not resumed until the 3d of April. The tolls received from the 1st of November, 1835, to the same period in 1836, were $133,025.21 being a larger amount than during any previous year, except 1835, when the receipts were $135,254.20.

During the season the navigation has not at any time been interrupted, but has been in admirable order, exempt from breaches, and furnished with an ample supply of water, to have passed with facility a greatly increased trade. This work is an important link in the chain of water communication between the East and West, in the great system of internal improvements in Pennsylvania, which are extending in all directions, and giving facilities to her immense resources in her mineral, agricultural and other productions, which are increasing with unexampled rapidity. The conviction is irresistable that the trade will be augmented so as at no distant period to remunerate the stockholders for their advances. With all these flattering anticipations in view, the finances of the Company are not exempt from temporary embarrassment, and the Managers have been under the necessity of issuing certificates bearing interest, instead of cash payments, on the interest of its debt.

The present condition of the Company, is

Capital invested in the Canal,		$2,618,100
Consisting of 4189 shares of stock, at $200 per share,	$837,800	
Permanent Loans,	$1,780,000	
		$2,618,100
The annual interest on loans, requires		$106,818

The Board believe that next year the nett income will be adequate to meet the interest, and enable them to dispose of so much of an unsold loan of $525,000, as will enable them to redeem such certificates of interest as may be issued, prior to the period at which they may be made payable.

During the last winter the large Aqueduct on the navigable feeder across the Swatara, and an aqueduct below Reading, were renewed. Part of the line on the summit level, and of the navigable feeder, were also lined with plank. The large waste Wier, near the Water Works has been renewed. Suggestions have been made that the interests of the Company, and the community would be essentially promoted by an enlargement of the locks, so that boats 13 feet wide might navigate the canal. This desirable measure cannot be accomplished by the Board without the aid of the Commonwealth. An experienced engineer has been appointed to examine the whole line of Canal, and report the practicability and cost of so great an undertaking.

STATEMENT

Of the amount of tonnage which passed the Union Canal, from the 1st Nov., 1835, to the 1st Nov., 1836.

		Pounds.
Flour, 75,916 bbls. weighing		16,245,053
Grain, 613,302 bushels,		36,798,137
Whiskey, 14,969 bbls.,		4,490,930
Iron, bar, pig, and castings,	14,120,626	
Iron, railroad,	2,568,889	22,419,266
—— ore,	5,729,751	
Coal, anthracite,		26,230,342
—— bituminous,		15,636,426
Lumber, 13,276,000 feet,		29,740,392
Shingles,		6,642,611
Staves,		950,618
Gypsum,		17,900,877
Fish, 21,130 bbls.,		6,339,140
Salt, 93,914 bushels,		5,634,879
Merchandize,		42,815,096
Tobacco,		1,948,101
Wool,		261,271
Seeds of all kinds,		1,320,645
Bacon,		1,539,536
Cotton,		8,436
Queensware,		5,259,448
Leather,		861,402
Sundries, consisting of butter, lard, pork, lime, limestone, marble, bricks, grindstones, live hogs, fruit, &c. &c.,		23,342,560
		262,385,166

Equal to 117,136 tons.

Total number of boats which passed the Canal this year, 7,022.

Amount of tolls received during the year ending Nov. 1st., 1836, $133,025.21.

Miscellaneous.

IMPROVEMENTS IN STEAM CARRIAGES ON COMMON ROADS.—We noticed in the preceding volume of this Magazine, two inventions of M. Galy Cazalat, which were designed for the improvement of steam carriages. We have since learnt, by a communication from the inventor, that they are part only of a series which has for its object the accomplishment of a problem in which so many have failed, and so much capital has been unproductively expended —the construction of a safe steam carriage, for the conveyance of passengers at a desirable velocity on common roads, which shall be perfectly safe from accidents by explosion, &c.

After a long and careful examination of the subject, and many experiments, on a full scale, M. Galy Cazalat decided, that the following ameliorations were all desirable in the most improved carriages yet known, and most of them necessary; these he conceives he has perfectly accomplished in his steam carriage.

1. An arrangement by which the liability of the axle-tree-crank to break is diminished.

2. A mode of suspension of the engine, &c., which prevents its action from being disturbed by joltage.*

3. An apparatus for guiding the carriage by means of the steam itself, with great facility.

4. An hydraulic break for diminishing the velocity, and, when desirable, entirely stopping a steam carriage, upon a declivity.

5. A steam-generator, of simple construction and little weight; with a fire place in which coal may be used as a fuel without giving out smoke.

6. An apparatus of great simplicity and of easy application, by which explosions of steam generators and boilers may be, at all times, *prevented*.†

7. An apparatus, also of great simplicity, and incapable of derangement, by which the water surface in steam generators and boilers is constantly maintained during the working of the engine at the same level.

It will be evident to all who understand the subject, that supposing M. Galy Cazalat has succeeded to the extent which he describes, he has removed nearly all the more important impediments which have up to this moment obstructed the progress of this valuable application of steam power.

[Mag. Pop. Sc.]

METHOD OF DETERMINING THE VALUE OF BLACK OXIDE OF MANGANESE FOR MANUFACTURING PURPOSES. BY THOMAS THOMPSON, M. D., F. R. S., L. AND E. REGIUS, PROFESSOR OF CHEMISTRY IN THE UNIVERSITY OF GLASGOW.

The manganese to be tested must be reduced to a fine powder, or brought into the state in which it is used by the manufacturers of bleaching-powder. To determine its value, proceed in the following manner:

Into a balanced Florence flask put 600 grains of water, and 75 grains of crystals of oxalic acid. Then add 50 grains of the manganese to be tested; and, as quickly as possible, pour into the flask from 150 to 200 grains of concentrated sulphuric acid. This is best done by having a given weight of sulphuric acid, say 210 grains, previously weighed out in a glass measure, counterpoised on one of the scales of a balance. You pour into the flask as much of the sulphuric acid as you can conveniently.—Then, putting the measure again into the scale, you determine exactly how much has been put in.

A lively effervescence takes place, and carbonic acid gas is disengaged in abundance. Cover the mouth of the flask with paper, and leave it for twenty-four hours; then weigh it again. The loss of weight which the flask has sustained is exactly equal to the quantity of *binoxide* of manganese in the powder examined. Thus, let the loss of weight be 34 grains; the quantity of binoxide of manganese in the 50 grains of the powder which was tested will be 34 grains; or it will contain 68 per cent. of pure binoxide of manganese, and 32 per cent. of impurity.

To understand what takes place, it is necessary to recollect that oxalic acid is composed of

2 atoms carbon	1.5
3 atoms oxygen	3
	4.5

and that of binoxide of manganese is composed of

1 atom manganese	3.5
2 atoms oxygen	2
	5.5

The oxalic acid acts on the binoxide by abstracting one-half of its oxygen, which converts it into carbonic acid; hence the effervescence. 55 grains of pure binoxide of manganese would give out 10 grains of oxygen, which would convert 45 grains of oxalic acid into 55 grains of carbonic acid; which escaping, indicate, by the loss of weight, the quantity of carbonic acid formed. Now, it happens that the weight of the carbonic acid formed is exactly equal to the quantity of binoxide of manganese which gives out its oxygen to the oxalic acid.—Hence the reason of the accuracy of the test.

In other words, an integral particle of binoxide of manganese, which weighs 5.5, gives out 1 atom of oxygen. This atom of oxygen combines with an integrant particle of oxalic acid, weighing 4.5, and converts it into two integrant particles of carbonic acid, which both together weigh 5.5. As this carbonic acid escapes, the loss of weight must be just equal to the quantity of binoxide of manganese in the powder subjected to experiment.

In practice, I find that a small quantity of the binoxide of manganese sometimes escapes the action of the oxalic acid, being probably screened by the great quantity of impurity with which it is mixed. But the deficiency of carbonic acid occasioned by this, is about made up by the moisture which the carbonic acid gas carries off along with it. This renders the error, in general, trifling.

It will be proper to subjoin an example or two of the method of proceeding, to enable the reader to judge of the goodness of this test, and its value to the manufacturer.

The black oxide of manganese employed was subjected to analysis, and found composed of

Binoxide of manganese	68.4
Peroxide of iron	11.8
Water	5.6
Earthy matter	13.9
	100.0

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* Examined and approved by the Institute of France, and rewarded with their gold medal, in 1833.

† Examined, tested, and approved by LA SOCIETIE D'ENCOURAGEMENT of Paris, and rewarded with their large gold medal, in December, 1835.

EXPERIMENT 1.

into the flask—

Water	599 grains.
Oxalic acid	75
Black oxide	50
Sulphuric acid	184
Total	908

ss of weight 32.5 grains. It ought ve been 34.245 grains. Error 1.745 s.

EXPERIMENT 2.

into the flask—

Water	600 grains.
Oxalic acid	75
Black oxide	50
Sulphuric acide	154
Total	879

ss of weight 34.5 grains. It ought ve been 34.245 grains. Here the er- s in excess, and amounts to 0.255 s.

EXPERIMENT 3.

nto the flask—

Water	600 grains.
Oxalic acid	75
Black oxide	50
Sulphuric acid	154.1
Total	879.1

ss of weight 35 grains. Here also ror was in excess, and amounted to grains.

us take the mean of these three ex- ents :

ss of weight by	1st	32.5 grains,
	2nd	34.5
	3rd	35.0
	3)102	
Mean		34 grains.

e the error amounts to 0.245 grains, is considerably less than one per If, therefore, three trials be made, or will be under 1 per cent. ; so that ethod is quite sufficient to indicate nearly the quantity of binoxide of nese in any ore. Now, it is the e of manganese alone that is useful manufacturer ; the sesqui-oxide and de availing very little in the prepara- chlorine, for which almost alone the used by manufactures.

d various other proportions of the ents, but found the preceding the I tried, also, the effect of rubbing a mortar the oxalic acid and black But the error is least when the cid is merely poured into the water, black oxide added before the acid lved. Unless the sulphuric acid be last, we cannot be sure of our —[Rec. Gen. Sc. June, 1836.]

LUTION OF LIGHT DURING CRYSTA- ON.—A dull light sometimes appears solution is in the process of crysta- ut the phenomenon has been con- as accidental and never exhibited or as an experiment. A method n pointed out by Henri Rose of Berlin, by which this light can be produced at any time.

Put two or three drams of arsenious acid, of a vitreous aspect, in a clear glass ma- rass, and sprinkle it with an ounce and a half of non fuming, common hydrochloric acid, and half an ounce of water. Heat it to ebullition, let it boil ten or fifteen min- utes, then cool it as slowly as possible by gradually lowering the lamp or removing the heat. If the crystals begin to form in a dark place, the creation is accompanied with a vivid light, and the formation of each little crystal is attended with a spark. If the vessel be shaken a great number of crystals are suddenly formed, and as many sparks produced. If a larger proportionate quantity of the materials be taken, such as an ounce or two of arsenious acid, the light, at a favorable moment, will, on shaking the bottle, illuminate a dark chamber. This power of giving light sometimes continues two or three days in succession, but be- comes very faint, depending evidently, on the continuance of crystalization, and not on the electricity of friction by agitation.

If the hot solution be suddenly cooled so as to produce a pulverulent mass of the arsenious acid, no light, or at best, a very feeble one, will be seen. The crystaliza- tion of sulphate of potash has been most frequently observed to emit light, but al- ways accidentally, and never perhaps in the *pure* sulphate.

Arsenious acid is known to exist in two different isomeric conditions. It is either transparent and vitreous, or porcelainous and opaque. After fusion it is quite trans- parent, but in time becomes milk white and opaque, without any increase of weight.— Both the specific gravity, however, and the solubility in water are different in these two states. In the opaque acid, commonly used as rats bane, no light has been observ- ed by the author, or at best, a very feeble one, on slow cooling.

The cause of the evolution of light in the case now described, is considered by Rose as unknown, and in need of additional facts to render it intelligible. Berzelius remarked the appearance of light during the crystalization of fluoride of sodium, in a liquid which held that salt in solution.— [Jour. de Pharmacie. Avr.]

SPIRIT OF WOOD.—DUMAS and PELI- GOT, have lately discovered a very remark- able product which they have named *Spirit of Wood*. It resembles very closely alco- hol or spirit of wine. Treated with four times its weight of sulphuric acid, it fur- nishes an ether which has precisely the same composition and density; and with various acids, benzoic, acetic, oxalic, &c., it yields as many different ethers, for which these gentlemen give exact formulæ. Its chemical agencies and properties appear to be quite as certain and well defined as those of alcohol, and it is presumed that ethers may be obtained from it which alco- hol does not yield. Spirit of wood, purified, is already on sale, at Lemire's, Rue de la Verrerie, No. 19, Paris.—[Recuiel Indus. Avril.]

NOTE ON THE ASSAY OF GILDED WARE BY THE WET PROCESS. By H. BOULIGNY, ASSAYER AT EVREUX.—The art of assay- ing the precious metals or determining their proportions in alloys, so long stationary, has within a few years made immense progress. M. Gay Lussac, in reducing to form his method of assaying by the wet process, has, if we may so term it, established the limits of this art in relation to silver. This process is nevertheless not generally adopt- ed, notwithstand its precision and other ad- vantages. The application of this method to the analysis of building begins also to spread. It is thus practised : Boil the alloy in a mattrass with nitric acid, and precipi- tate the silver by the normal solution. The proportion of silver being known, dissolve the chloride of silver in ammonia, and the gold, which is insoluble in that alkali, is re- covered in the usual way, and finally weighed.

This process, which is very exact when the alloy contains no tin, appears somewhat complicated to assayers who are not accus- tomed to chemical manipulations. That which I propose, is founded on the same principles and will appear perhaps of easier execution as it does not require the use of ammonia.

Take a quantity of the alloy containing about 1000 of fine silver, boil it ten min- utes in a ground mattrass with 30 grammes of nitric acid at 22°, decant with care into a ground flask of the capacity of about 250 grammes; boil the alloy again five min- utes in 15 grammes of nitric acid, at 36° and decant with equal care this solution into the flask ; pour into the mattrass 30 grammes of distilled water to remove all the nitrate and add it to the two former so- lutions. The flask which contains them is to be stopped and set aside. If any particles of nitrate of silver should adhere to the orifice of the mattrass they must be carefully removed and added to the solu- tion in the flask.

Fill the mattrass with distilled water, and reverse it in a crucible to collect the gold which must be dried and weighed. This weight is that of the gold contained in the alloy, which must be brought to unity by the rule of proportion. If, for example there were 1114.82 of alloy and 4 mill. of gold have been obtained, the weight of this metal in 1000 would be the fourth term in the proportion $1114.82 : 4 :: 1000 : x$

$$x = \frac{1000 \times 4}{1114.82} = 3.588$$

The flask containing the solution of sil- ver and copper, will be marked as an assay for silver, and the operation will be com- pleted.

If the alloy contain tin, which would be known by the presence of a white powder at the bottom of the mattrass, this process would by no means answer. Recourse must then be had to cupellation and parting.

In terminating this note, I ought to ob- serve, that this process is applicable only to gilding, which contains as a minimum of gold 150 to 1000 of alloy.—[Annales de Chim. Nov.]

COINS AND MEDALS.—In a lecture lately delivered before the Society of Arts, Mr. Wyon described our present mode of engraving and multiplying the dies.

The selection of the best cast-steel for the purpose, he observed, was very important, and not sufficiently understood at present. The very fine steel that forms excellent gravers, and other cutting instruments, is unfit for the purpose, for unless hardened with great care, it is very liable to crack. The very coarse steel is also objectionable, as it acquires fissures under the die press. The object therefore is, to select steel of a medium quality—but the best steel may be spoiled, by want of skill in the smith who forges the dies.

When the rough die is brought to a table in the turning lathe, after being softened, the engraver commences his labors, by working out the device with the small tools in intaglio (sunk in,) and when he has completed his work, the die is ready for hardening, which is, in itself, a very simple process. but one that is often attended with serious disappointment to the engraver, for it not unfrequently happens, that the labor of many months is either injured or utterly destroyed, from the steel itself being faulty or heated to excess. But supposing the original die, or as it is technically called, a matrix, to be uninjured by the process of hardening, it is reserved for the purpose, of furnishing a puncheon (or a steel impression in relief,) For this purpose a block of soft steel is turned flat at the bottom and obtusely conical at the top. In this state, its conical surface is compressed into the matrix by a blow from the multiplying die press: this gives us only the commencement of an impression, for the die becomes so hard by compression, as to require frequent annealing and re-striking before it is perfected. An impression taken in this way is called a puncheon, which, when the engraver has given it all the delicacy of finish existing in the original, is then hardened, and serves for the purpose of making dies for coining, by a similar process, viz, impressing the hardened steel into that which is soft.

The distinction, said Mr. Wyon, between striking medals and coins, is very essential, so much so, that I cannot avoid saying a few words on the subject. A medal is usually engraven in high relief, like those upon ancient coins, and it requires a succession of blows, sometimes forty or fifty, with repeated annealings, to make a perfect impression. A modern coin, on the contrary, is usually brought up with one blow, although with disadvantage of the metal being harder. Standard gold, for instance consists of one-twelfth of alloy; medals are usually made of fine gold; the engraving upon the coin is consequently made with a suitable degree of relief.

In striking a coin or a medal, the lateral spread of the metal, which would otherwise ooze out, as it were, from between the dies is prevented by the application of a steel collar, accurately turned to the dimensions of the dies. The number of pieces which may be struck by one pair of dies, not unfrequently amounts to between three and four hundred thousand, but the average amount is much less. Mr. Wyon stated, that he remembered instances of twenty dies being destroyed in one day, owing to the different qualities of steel, and to the casualties to which dies are liable. There are, it appears, eight presses in the coining room of the Mint, and he considers that the destruction of one pair of dies for each press per day, is a very fair proportion, though it is generally rather more.

It must be remembered, that each press produces sixty pieces per minute, without reckoning stoppages occasioned by changing of dies and other contingencies; and Mr. Wyon remarked, that in 1817, the daily produces of coins, in half-crowns, shillings, and sixpences, amounting to the enormous quantity of 343,000 per day, for three months: at that time all the eight presses were employed; but, on the first of last April, there were 125,000 pieces coined with five presses only. From the 4th of June, 1817, to 31st of December, 1833, their were coined in sovereigns and half-sovereigns, 52,187, 265*l.* sterling.—[Arcana of Science, 1835.]

FROM A MEMOIR ON THE ORIGIN OF MT. ETNA, BY M. ELIE DE BEAUMONT, (ED. NEW PHIL. JOUR. AP. 1836.)—It has been ascertained that the greater number of the appearances of flames which accompany the volcanic eruptions, are only the effect of the rays of light which emanate from the incandescent lava, and which are reflected by the molecules of vesicular vapor, and of dust disseminated by the eruption in the atmosphere. In consequence of this observation, doubts have been raised as to whether volcanos, in any case, produce real flames. These doubts have been already removed by Sir H. Davy in regard to Vesuvius, where he ascertained, during a small eruption, the existence of a real jet of flame; and we ourselves have observed on Etna incontestible volcanic flames.—Having left the *Casa inglese* about an hour and a half before daybreak, in order to ascend to the edge of the crater, the feeble light of the stars enabled us to perceive, on the commencement of the acclivity of the upper-cone, a white space whose color was caused by the alteration of the rocks, and by saline efflorescences having a very styptic taste. In the midst of this space, at several points, we distinguished pale and scarcely luminous flames, which seemed to issue from the earth; they occupied the orifices of several irregular openings, which were from one to two yards in width, and were only the enlargements of a tortuous crevice. These flames were evidently produced by a gas disengaged from the crevice, and which did not find the oxygen necessary for its combustion till it reached the external air. The combustion took place almost exactly at the level of the surface of the ground. The flame rarely rose to the height of a yard; it produced a sound somewhat intermittent, pretty analogous to that of several lighted faggots, or rather that which is heard at the bottom of a blast-furnace when the blowing apparatus is badly constructed. The gases produced by the combustion did not impede the breathing, and had a strong odor of sulphurous acid. Sulphuretted hydrogen was also p
ceptible, but I did not recognize the odor
muriatic acid. Every circumstance, th
nnounced that the flame was supported
sulphuretted hydrogen, and afterwar
when the sun lighted up the mountain
long bluish cloud was seen taking its
from that particular point.

In the interior of the great crater I fo
several portions of snow, but from many
er points of its angular bottom there i
ed hot vapors, having a whitish color, m
or less dense, composed chiefly of wa
vapor, but having nevertheless a strong o
of sulphurous and muriatic acids; one
the other of these acids predominated al
nately. The surfaces across which the
pors were disengaged were in part cov
by saline efflorescences, which were so
times white, and sometimes colored of
orange-yellow tint by the chloruret of i
or of a canary-yellow by particles of
altered by the acid vapors. In some
sures I found white fibrous gypsum, mi
with altered pulverulent yellow lan
which some small nodules of sulphur w
disseminated.

The above account of the observation
this distinguished geologist is followed b
statement of his theory of the formatio
the mountain. After alluding to the ch
es of form that have resulted from the
quent production of extensive longitu
fissures by the earthquakes that acco
ny or precede an eruption of the volc
also to the streams of lava that find
exit through these fissures; to the une
elevation of their sides by the expan
force below, he draws the conclusion
the foundations of Etna are not immo
fixed, but are undergoing frequent cha
Guided by these considerations, and i
dition, observing the extreme slow
with which ejected matter is capable o
vating the central peak, and the impro
lity, from their structure and situation
the layers composing the mountain a
the position they were originally accu
ted, the author arrives at the followin
ductions.

The surface formerly nearly flat, ha
first repeatedly fractured in various
having a nearly constant direction.
melted matters have been poure
through the fissures thus produced
their fluidity must have been nearly p
for they have flowed through rents o
inconsiderable breadth. These pr
were then spread on both sides of t
sures, in thin and uniform masses,
to those composed of basalt, which
many different countries, and especi
Iceland, are superimposed above on
ther, forming vast plateaus whose
remained always nearly horizontal,
sequence of the subdivision of suc
lines of eruption on an extensive sp
The eruptions were, like those of t
sent day, accompanied by disengag
of elastic fluids, which, issuing like b
itself from the whole extent of the f
carried along with them scoriæ and c
These scoriæ and cinders falling ba
rain, both on the lava and on the ne
ing spots, produced those uniform la
fragmentary substances, which alterna

the layers of melted matters. But at one period, it would appear that the internal agent which had already fractured so frequently the solid surface, having doubtless exerted an extraordinary energy, *broke up that surface, upraised it, and since that time Etna has existed.*

GREAT BLAST AT CRAIGLEITH QUARRY.—The long time in which preparations for a great explosion at this quarry had been going on, and the effects that were expected to result from the experiment, by a great saving of labor and expense, in at once dislodging a great mass of rock and also lessening, if not altogether removing, the risk which attends the blowing up of smal portions of rock from the flying fragments, rendered the experiment which took place on Saturday the 18th of October, 1834, a subject of much interest both in a public and scientific point of view. It having been intimated by bills that the blast was to take place at three o'clock, long before that hour crowds of people were proceeding along the roads leading to the quarry, and by three o'clock every place which commanded a view of the spot was filled with spectators. At the time when the explosion took place, there were no fewer than ten thousand persons on the grounds around the quarry; and curiosity was so much excited, that even the Castle-hill, and also on the Carstorphine-hill, a great many people were collected. At half past two o'clock, the conductor, inclosed in a block-tin tube twenty-six feet long and half an inch in diameter, was introduced into the bore. The depth of the bore was sixty feet, and seven and a half inches in diameter at the top, and six at the bottom, and was charged with 500 lbs, of Sir Henry Bridge's double-strong blasting powder At half past three the match was lighted, and in three minntes the explosion took place. The report was not so loud as from a small piece of ordnance; but the effect that was produced was highly satisfactory to all the scientific gentlemen present, and completely fulfilled the expectations that had been conceived by the projector. At the moment of the explosion, the great mass of rock appeared to those at a short distance to be forced upwards, and then to rend in large and deep fissures. It is calculated that upwards of 20,000 tons of solid rock have been displaced by this experiment.—[Ibid.]

EXHIBITION OF MR. COCHRANE'S FIRE ARMS.—We understand that Mr. Cochrane, of whose astonishing and important improvements in fire arms, the newspapers have lately furnished most interesting descriptions, has lately visited Washington and made a series of experiments at the Arsenal, in the presence of several military and scientific gentlemen, who were highly gratified at the result. These experiments were made on Saturday last. Yesterday we had the pleasure of conversing for some time with Mr. Cochrane, on the subject of his invention; and accompanied him to Brown's Hotel, where he showed us, his rifle and carbine. With the permission of Mr. Cochrane, we lay before the public, the following reports of the military gentlemen, in whose presence, and under whose supervision, the experiments were made:— [Alex. Gaz.]

WASHINGTON, November 21st, 1836.

COLONEL:—The enclosed report of Lieutenant Scott, which I have the honor to submit, fully confirms the high estimate I had formed of Mr. Cochrane's gun, from the experiments instituted by me on Saturday, in conformity with your instructions.

Under my supervision the gun was loaded and discharged 500 times—the results proving its great accuracy, safety, and facility of loading and firing. My attention was particularly called to the apparent danger of ignition, from the contiguity of the charges. But from the experiments freely made by Mr. Cochrane, by placing loose powder in the chambers over the balls, and around the caps, I am convinced that my apprehensions were unfounded.

I do not hesitate to say, that with my closest scrutiny, I could not discover any objections to Mr. Cochrane's invention. It will be well to remark, that the gun was discharged in all, one thousand and eight times, without being cleaned and without missing fire.

The flattened balls accompanying this were fired through an inch plank against a brick wall at a distance of 150 yards.

I am, sir, very respectfully,
Your obedient servant,
GEORGE D. RAMSAY,
Captain of Ordnance,

COLONEL BOMFORD,
U. S. Ordnance.

—

The piece was fired this morning 500 times, (making in all 1,008.) It is in the same order it was previous to discharging it. Water was put into the chambers, and left for one hour and ten minutes. Afterwards it was discharged in the same manner as the others, without the least difficulty. It fires with great accuracy. I tried it with Hall's carbine, both being loaded; the firing was commenced, and during the discharging of the nine chambers, the carbine could only be loaded once. Not a cap missed. At the distance of 150 yards—charge, 10 grains of powder, the ball perforated an inch pine board, and was flattened against the brick wall. For simplicity it surpasses any thing of the kind I have yet seen, and as a fire arm, its qualities can be summed up in three words. It is perfect.

JOHN B. SCOTT,
First Lieut. Artillery,

WASHINGTON ARSENAL,
Nov. 20th, 1836.

Mr. Cochrane fired the nine chambers in SIX SECONDS.

JOHN B. SCOTT,
First Lieut. Artillery.

From the Northampton Courier.

ELEGANT GHINESE PAINTINGS.

A gentleman who has long been engaged in the Canton trade, often visited that city, and had opportunities to become acquainted with the manners and habits of Chinese, has lately visited Northampton to become acquainted with the state of the silk culture here, from whose scrutinising observations made in China, much valuable information has been obtained. The same gentleman loaned the subscriber a volume of splendid Chinese Paintings, which confirms our practice and culture of the Chinese mulberry as correct and proper. These paintings represent the men, women and children in their national costume, at work—commencing with gathering the mulberry seed, cleaning the same, and then preparing the ground, sowing the seed, transplanting the young seedlings, gathering the foliage, feeding the worms, heading or cutting down the plants to 2 or 4 inches above the ground, as *we do*, and every process of their management, to making up of the silk into skeins, as *we import it*, and the further process of winding the silk upon spools.

There are 28 plates, illustrating the different processes. The out door men laborers are dressed in plain loose frocks and trowsers, descending to the knees; some of the men with bare feet and legs; others with sandals and wooden shoes, adapted to their respective work of getting the plants in forwardness for feeding the worms.—The women, boys and girls are employed in gathering leaves, feeding the worms, reeling silk, &c. Some of the ladies have elegant *loose* dresses, of various brilliant colors, ornamented with wide embroidery around the neck and sleeves. The upper dress is loose, of gay colors, the sleeves large, and extend a little above the elbow; and all the females are dressed in *pantalettes* of various colors, each in contact with the upper dress—the countenance fair, delicate and intelligent, eyes downcast; most of the females have small feet and gay sandals; the hair neatly dressed, ornamented, and all wear bracelets above the wrists. As the original plates can be seen by only a few, it may be desirable to hear some description of each print, for the gratification of those who take some interest in the culture of silk.

The plates make it evident, that although the Chinese sow the mulberry seed *broad cast* as we do small grain, yet they do not let it long grow in that state, nor do they cut it off (as we do grass) for feeding worms, but they transplant it into settings or hills, like our Indian corn, and that it does not grow more than three or four feet in height, and is cut down every year to keep it in a shrubby state. Experience has convinced us that this procedure of taking off the tops to 2 to 4 or even 6 inches above the root, every autumn, and covering the stump with earth, is the best way to secure the Chinese mulberry against the severity of winter, and is also a sure method to multiply the number of trees and increase the quantity of foliage.

Some people have thought that the Chinese mulberry seed grew on trees of some height, like white mulberry (and on this account have been desirous of procuring large trees); so far as we have had experience, this is not the fact with the Canton mulberry, although it may be true of Manilla and other varieties.

The first plate represents the seed grow-

ing very near the ground, like the Canton mulberry, from the seed of which I imported and sowed in 1834. In 1835, one of the seedling trees being laid down, the layer sprouts produced full size mulberries, too late, however, for ripening. The same root this year, 1836, grow branches which were again laid down, and the layer sprouts, when 4 or 5 inches high, again had mulberries formed, which ripened in season for sowing, from which seed I have two small trees carefully preserved, to ascertain its character. After the seed had been gathered, the *same layer sprouts* again, with others, had plump mulberries formed, but were destroyed by birds or fowls. Both crops were formed only a little above the root or foot of the layer tree, and some of them rested on the ground. I have neither seen or heard of any other of the Canton plants producing seed; but what has already occurred here, in the formation and product of seed, together with the representation and the gathering of the seed and the description of the leaf in the Chinese paintings, confirms the opinion, that the *Canton Mulberry*, so called here, is the same as used in China for feeding worms. Experiments have been made this year in feeding worms with the Black, White, Manilla, and the Canton Multicaulis, and the worms evidently preferred the Canton to either of the others. If any one is possessed of the evidence that the Manilla Multicaulis is ever used in China for feeding worms, he is requested to make it known. The first notice we have of it is, that it was cultivated at Manilla as a *tree of ornament*. After being introduced into France, it was found that the silk worm would feed upon the Manilla, as they had done upon the white or black mulberry, in Europe or America. Last year a Manilla multicaulis of 6 or 7 feet in height produced a few seed, which grew several feet from the ground. The seed was planted and two or three of them vegetated and were preserved through the winter, and set out in spring, 1836, and grew about 2½ feet.—The leaves were in shape and size very different from the original tree, and the leaves not more than one quarter as large as the leaves of the parent stock. It may be noted, that a number of old white mulberry trees which have annually borne seed twenty or thirty years, grew within about forty rods of the Manilla multicaulis; the Multicaulis was exposed last winter on the southerly side of a building, and this year the dead tops have been taken off, but has not produced any seed, or even borne a blossom. D. STEBBINS.

We have watched the progress of Mr. Holcomb, with increasing pleasure. His instruments have undergone the most rigorous test, in comparison with others of European manufacture; the results have in all instances been highly favorable to Mr. Holcomb.

The method of mounting is described as peculiarly simple and happy.

We wish him all manner of success.

REPORT ON MR. HOLCOMB'S REFLECTING TELESCOPE.

The Committee on Science and the Arts, constituted by the Franklin Institute of the State of Pennsylvania, for the promotion of the Mechanic Arts, to whom was referred for examination a Reflecting Telescope, made by Mr. Amasa Holcomb, of Southwick, Massachusetts, for the Newark College, Delaware, REPORT:—

That the following description of the instrument is given by Mr. Holcomb: "The telescope submitted to the examination of the Committee is a Reflector on the plan of Sir Wm. Herchel. It is fourteen feet long and ten inches in diameter. It has six different magnifying powers from 70 to 1000."

The Committee proceeded to the examination of the telescope on the evening of the 17th instant. A trial was made of its various powers from 70 to 1000, upon the moon, upon several nebulæ, clusters, and double stars, and they beg leave to report as the result of that examination, that the instrument possesses all the superiority over any reflectors hitherto submitted by Mr. Holcomb, which its increased length and aperture would lead us to expect, and that it has every attribute of excellence which the best optical skill could give to an instrument of these dimensions. The Committee cannot forbear again commenting upon the excellence and simplicity of Mr. Holcomb's method of mounting the instrument, which notwithstanding its size, is portable, with all its mounting, by a single person.

The object is easily followed by the rack work and the inconvenience, from the motion of carriages at short distances from it, was not found to be greater with a power of 1000, than with a power of 100, in the common mode of mounting achromatics, moveable by rack work on an upright stand.

The short time allowed the Committee prevented them from making observations on close double stars, for the purpose of determining the limit of its optical capacity. All of which is respectfully submitted.

By order of the committee.

WILLIAM HAMILTON, *Actuary*.

Oct. 13, 1836.

Agriculture, &c.

From the Farmers' Cabinet—Philadelphia.

[We bespeak for the following communication the careful and candid consideration of our readers, as the subject is one of great moment. The author, Mr. RONALDSON, is well known as one of our most respectable and enterprising citizens. He is the same gentleman who succeeded in directing the attention of our citizens to the culture, of the Beet Root for the fabrication of sugar; (see Cabinet No. 4. vol. 1.) and his object in this enterprise, like that just referred to, is to benefit the community without any reference to pecuniary gain.]

TO THE FARMERS OF THE UNITED STATES.

That care and skill have improved fruit trees, vegetables, and our domestic animals are facts known to all classes of husbandmen, and the advantages of rearing cattle from the best breeds is now well understood all over America. The advantages that accompany procuring the best grain for seed is as yet but partially understood and very little attended to.

Repeatedly sowing some kinds of grain on the same land, is in many cases followed by an evident decline in the quality; still this, it must be observed is not a uniform consequence; there are many and well authenticated instances where the change to a new soil and climate is accompanied with a deterioration, and in others as great an improvement has taken place.

As it is known that grains, &c., in some climates and soils degenerate to a minimum, sometimes in quality, in others in quantity, and frequently in both; a practice calculated to remedy these disadvantages is of great importance to the agriculture of the United States. On the present occasion it is our object to point out what may be done here, by showing what is done in other countries, and under circumstances far less favorable to the husbandmen, or to the operations of husbandry, than in America. In Scotland, for example, the climate is cold, wet and stormy; yet by care and industry crops are produced, remarkable both for quantity and quality.—There the greatest attention is paid to the changing of seed. The low countries procure their seed potatoes from the high districts at great expense of money and labor. The whole oat crop of some districts is bought for, and sowed for seed; this is the case with a portion of country called Blainsley, that lays south of Soutria Hill. In no country has the culture of clover been more beneficial, or attended with better success than in Scotland, yet the climate is so unfavorable to the ripening of clover seed, that nearly the whole has to be procured from England or Holland. The farmers of that country frequently change the wheat seed, and procure the best that is to be had, paying very little respect to price, and the greatest attention to quality.

It would appear that the principle by which the Scotch farmers are guided to the results they obtain, is to select their seed from those districts where it is grown in the greatest perfection, from the climate and soil being best adapted to the plant. Thus they choose seed oats and potatoes of their own growing, these being plants best adapted to mountainous, cool and moist regions; and clover and wheat seed from England and Holland, which are comparatively low, warm and dry, and better adapted to their production.

It is well known that in America, our oats are not good, they have little kernel or meal; and the quality of our Barley is not what it ought to be.

It is to the following circumstance the present address owes its existence.

In the year 1833, a well informed practical farmer visited Pennsylvania with the object of seeing as much of our practice of farming, soil and climate, as a short stay here would permit. On his return to Scotland, he procured and sent to his friends in Philadelphia some Angus Oats, Hopeton Oats, Barley, Wheat and Rye-grass; the cask containing the seeds miscarried and did not arrive here until the fall of 1835.

Some of each kind of these seeds have been sown here; the wheat come up very thin; it is presumed the seed suffered from the long voyage. On the 18th April, 1836, the Oats and Barley were sown on rather poor but fresh loam. It is true, the season has been cool, damp and favorable to these grains, still their success has surpassed any thing that could have been calculated on.—The Barley and both kinds of Oats are of superior growth in strength of stem, as well as thickness on the ground; they would lose nothing in a comparison with the crops of Oats or Barley of any country, and are likely to suffer loss from excessive growth, causing them to lodge. One kind of Oats commenced shooting into ear about the 1st of July, and the other about the tenth; the marks which were placed to distinguish the one from the other had got displaced, and this accident prevents knowing whether it is the Angus or Hopeton Oaats that first puts out the ear.

Now let me inquire into the economy of farmers adopting the practice of annually supplying themselves with new seed grain and found our calculations on a farm where about 20 bushels of Oats are sown each year; the farmer of such a piece of land could supply himself with an annual change of his Oat seed in the following manner. It is presumed that each bushel of the imported Oats he sows, will produce 10 bushels; then by annually buying two bushels, their produce would yield the 20 bushels required for sowing on his farm. Suppose the price of the imported Oats to be $1,50 cents a bushel, the two would cost $3—and the price of country oats was 50 cents, the two would cost $1.—The expense of changing the seed would be per annum $2. The estimate is not given as a matter of accuracy, but as a formula by which every one can make his own calculations.

In procuring a change of seed, there are other points necessary to be attended to besides the quality of the grain, and one of these is to guard against bringing with it the weeds incident to the country or fields where it has grown: for want of attention to this, there are farmers who have introduced into their fields, along with the clover they sowed, the narrow leafed plantain, which arrogates to itself a place which would otherwise be occupied by clover, to the detriment of his hay both in quality and quantity, and that more serious curse, Bensalem clover or white dailsy; all this is the result of their not taking sufficient care in the selection of their clover seed.

In the British Islands, their Oats and Barley fields at some seasons, are entirely yellow; nothing is to be seen save the bloom of the wild mustard, in some districts called Sheldrieks; and this is not the only one of this class of yellow flowering spring weed,—in Wheat they have what is here called Cockle, the seed of which is detrimental to superfine flower; all these should be guarded against by the European agent; and to prevent mischief, the seed after it arrives here should be sifted in a sieve that will separate the weeds from the pure grain, always collecting and burning the obnoxious seeds.

In proof of the sincerity, that the writer entertains a favorable opinion of this system, he will import for next season's sowing, one hundred bushels of selected Barley, one hundred of each variety of Oats, already spoken of, and, it being too late for receiving wheat for the ensuing sowing, measures will be taken for bringing to this country wheat for the following year.

Such persons as take an interest in renewing their seed grain, are invited to apply to the subscriber who will furnish them with any quantity, not less than a bushel. The cost will be governed by the price abroad, and the expense of bringing the articles here. The transaction will be attended with considerable trouble, and the limited extent of the operation will satisfy all who reflect, that there are other motives for undertaking the business than that of making money.

Letters post paid, will be duly attended to, addressed to

JAMES RONALDSON.

No. 200 south Ninth-street, Philadelphia.

P. S. Editors of newspapers who take an interest in the advancement af our agriculture are requested to insert the preceding in their papers.

From the Chicago (Illinois) American.

THE WESTERN "BARRENS."

Barrens are a species of country of a mixed character, uniting forest and prairie. They are covered with scattering oaks, rough and stunted in their appearance, interspersed with patches of hazel, brushwood, and tough grass. They appear to be the result of the contest which the fire is periodically continuing with the timber. The appearance of this description of country led the early settlers of the State to suppose that the scantiness of timber was owing to the poverty of the soil; and hence the title, thus ignorantly given, and calculated to convey erroneous notions to our eastern farmers became of universal application to this extensive tract of country. It is ascertained, however, that these *barrens* embrace as productive a soil as can be found in the State—healthy—more rolling than the prairies, and abounding with that important requisite to desirable farms, good springs. The fire visits these barrens in the fall, but owing to the insufficiency of the fuel, is not able to destroy, entirely, the timber. The farmer may settle, without hesitation or fear, in any part of this species of land, where he can find timber sufficient for his present purposes and wants, for the soil is supposed to be better adapted to all the interests of agriculture, and the vicissitudes of the season, than the deeper and richer mould of bottom and prairie land. Where the fire is prevented from the ravages, (as it easily can be by the occupant of the soil,) heavy timber springs up with a rapidity which would be incredible to the northern emigrant. High insulated *bluffs*, of a conical form, and exhibiting the appearance of connected ridges, rise up from the bottoms along the rivers which meander and fertilize them; they are from one to three hundred feet in height. *Knobs* of land, stony, and often rocky, at their summits, are found along the rivers, in some sections of the State, separated by deep ravines. The prairies are often intersected by ravines leading down to the streams. Deep sink holes, which serve to drain off the waters, are found in some parts, and prove that the substance is secondary limestone, abounding in subteraneous cavities. Very little that is denominated in the eastern States *stony* ground is found in this State. There are quarries of stone in the bluffs, in the banks of the streams, and in the ravines. In the vicinity of Julict, and many other promising villages, an abundance of stone can be procured, admirably adapted to the purposes of building, uniting durability with great beauty and warmth. *Timber*, were it *equally* distributed in this State, would be adequate to the necessties of the settlers. Its apparent scarcity, where the prairie prevails, is not to be so great an obstacle to settlement as has been generally imagined. Substitutes have been found for many of the purposes to which timber is generally applied: and the rapidity with which prairie, under the hand of care and cultivation, becomes converted into forest of timber, affords a sure guaranty for the future.

The kinds of timber most abundant in the State are oaks of the various species, black and white walnut, ash of the several varieties, elm, sugar maple, honey, locust, hackberry, linden, hickory, cotton-wood, pecan, mulberry, buck-eye, sycamore, cherry, box, elder, sassafras, and persimmon. In the southern and eastern parts of the State, yellow poplar and beech may be found. Near the Ohio are cypress trees, and in several counties clumps of yellow pine and cedar. On the Calumet, near the south end of Lake Michigan, is a forest of small pine. The underwood growth consists principally of redbud, pawpaw, sumach, plum, crab-apple, grape-vine, dog-wood, spice bush, green-brier, hazel, etc. The trees in this State are very luxuriant in their growth, and are frequently found of a stupendous size, particularly the cotton-wood and sycamore, on the alluvial soil of the rivers.

From the United States Gazette.

BEET SUGAR.

To J. R. Chandler, Esq.—Sir: Perceiving by the many applications made to me for information respecting beet sugar, that not only a very general interest prevails on the subject, but also some very erroneous views, I take leave, through your wide circulating paper, to publish a few of my ideas thereon, being the conclusion I have come to, after numerous experiments, as well as from information I have obtained from the most scientific French authorities.

1. An establishment will not clear its expense unless it be calculated to manufacture at least from two to five hundred pounds of sugar per day, so that the idea of individuals in this country manufacturing profitably for private consumption is preposterous; their sugar would stand them, including labor, a dollar per pound.

2. The greatest advantage will be derived from steam power, which will accomplish three objects at least, viz.: first, the rasping of the beets; secondly, the reducing of the liquor "in vacuo;" and thirdly, the boiling of the syrup without the risk of burning it, of which the beet syrup is in much greater danger than the cane syrup; the proof of the former being some degrees higher than that of the latter.

3. The juice of the beet decomposes in the summer in this country in less than two hours. I have known the visced fermentation commence in twenty minutes.—When this once occurs, sugar can never be obtained from it: in a large establishment in this country, it must be prevented by chemical agents.

4. Not only must the acid be neutralized, but the mucilage must be chemically coagulated, the cerate decomposed, and the malate of lime extracted, or the crystalizing will be rendered extremely difficult, if not totally impracticable in many cases, and good sugar will never be made.

5. I am persuaded the refining process can be profitably united to the manufacture of the raw sugar.

6. The profits are incredibly increased in proportion to the extensiveness of the establishment, but no one ought to engage in this business who has not *mind*, as well as a capital.

7. One half of the manufacturing expenses will be saved by a scientific arrangement of the apparatus, so as to dispense with, as much as possible, manual labor.

8. Understanding from various farmers within from ten to twenty miles of this city, that they are perfectly content with about twenty or twenty-five dollars per acre's produce, and as each acre ought to yield on an average 40,000 lbs. of beets, which will produce 2400 lbs. of sugar, I have made the following estimate. Supposing the apparatus to be capable of working only about 100 lbs. of sugar per day, it would take twenty-four days to manufacture 2400 lbs. of sugar.

EXPENSES.

One acre of beets (40,000 lbs.)	$25 00
Two men for 24 days,	48 00
Two boys for do.	22 00
Fire and rent, &c.	40 00
Total,	$135 00

RECEIPTS.

Quantity of sugar from the acre of beets, would be 2400 lbs. which at ten cents per lb. would be	$240 00
Beet cake and molasses, &c.	20 00
Total,	$260 00
Expenses,	135 00
Profits,	$125 00

By this general statement it will be perceived that there will be nearly cent. per cent. profit; but then the interest of the capital sunk in the purchase of machinery is not included. On the other hand, the two men could work twice or four times as much, and the apparatus for the increased quantity cost very little more.

If you think these remarks worth publishing, you are welcome to them, and I am, sir, your very obedient servant.

W. W. Sleigh.

Hamilton Village, cor. of Cedar Lane.
September 30, 1836.

From the Maine Farmer.

Anti-Cattle Choker.—Our worthy friend Paine Wingate, has left in our office an instrument with the above title. It is what is *vulgarly* called a tarred rope, and we should call it a very useful and efficient instrument. There should be one in every neighborhood, for it is a fact that cattle are liable to get choked, the world over, and being choked ought to be relieved by the aid of man. But why is a tarred rope better for this purpose than a *cordwood stick?* For various reasons. It is sufficiently stiff to effect the business nine times in ten, and at the same time has that kind of elasticity which will accommodate itself to a position or passage not entirely straight.

In order to make one, take a piece of tarred rope, say one inch in diameter, and six feet long, Untwist it three or four inches at the end and leave a tuft of it loose in order to make a kind of ball or swablike end, then wind round it a piece of canvass or cloth in order to make the surface smooth, and over this roll or wind some spun yarn tightly and smoothly. In cold weather this rope should be warmed a little before using, and in warm weather it is well to wet it. When about to use it the tuft at the end should be tarred back, and this will make a soft but sufficiently solid bulb to fill the gullet when pushed down.

Seed Hod.—The above gentleman has also deposited for a shost time, a vessel called a lift or seed hod, an implement well known in some places, but not seen in this vicinity very often. It is simple in its form and construction, and its use is to carry seed and other things when sowing. It is of an oval shape with sides bent in somewhat like the body of a fiddle. On one side is a hook and on the other an upright handle. When in use it has a band put over the shoulder and hooked into the hook; this brings it up snug to the left side of the body, and the left hand takes hold of the upright handle while the right hand is at liberty to scatter the seed. We hope some of our coopers will call and look at it, and "*get about*" making some of them for this market.

From the Cultivator.

CULTURE OF COTTON.

J. Buel, Dear Sir—Having recently become a subscriber to your very valuable publication, the "Cultivator," and deeming it highly incumbent upon each subscriber, to contribute his "quota" of agricultural information towards promoting the end of your publication, I send you the following as the most generally adopted mode of cultivating cotton in North Carolina. The land is "bedded," or broken up as soon after picking out as possible, (the earlier the better) with a plough drawn by two horses. The beds are from 3½ to 4 feet wide. After the earth has settled, and become somewhat indurated through the influence of rains and the sun, a double horse harrow is applied to the ridges, succeded immediately by a smaller one, which reduces the land to a perfect state of pulverization. Next follows the "marker," drawn by one horse, which makes a small trench on the middle of the ridge, in which the seed are strewn by hand. The seeds are rubbed, previous to planting, in ashes and water, which process embodies three distinct advantages. 1. It enables each seed to assume a separate position when sown. 2. It acts as a stimulant upon the plant—and 3d. It checks the ravages of that destructive insect, the "cut-worm." The seeds are covered very lightly, say from 1 to 1½ inches, by means of a small harrow of 6 or 8 teeth. Next in order is the process of "shaving," which consists in applying the weeding-hoe to each side of the cotton on the ridge; after which the bar of a single-horse plough is run at such a distance from the cotton as will not disturb its lateral roots, by which, all the grass that is taken from the vicinity of the plant is entirely covered in the middle of the alley or water-furrow. About 8 or 10 days subsequent to this, (the grass being completely dead) a triangular harrow is run upon the list formed by the two furrows thrown *from* the cotton, and two furrows thrown *to* the cotton, by means of a small plough. I forgot to state above, that immediately after "shaving and barring," the cotton is chopped through by the weeding-hoe, at intervals of 8 or 10 inches, and the most promising and luxuriant stalks selected, leaving from one to two in a hill. Next follows the "dirting process," as it is termed, which by some is done with the hand, by others with the hoe. The former mode is too laborious, and far from being the most *effectual* and *expeditious*.—When the cotton has attained a considerable height, the bar is run very *shallow*, and the plough is run *deep*, when the mould-board is turned to the cotton, to prevent "*firing*." The cultivation then is perfected by alternately "barring" and turning the mould-board to the cotton, immediately followed by the hoes, for the purpose of more effectually dirting the cotton, and uncovering those branches which the mould-board may have covered. Some of my neighbors "top" their cotton; they think it causes the plant to expand more, and form more pods. I should like to see in your next number a description of the "Cultivator," which you recommend to your readers, as entirely superceding the necessity of the plough and hoe in the cultivation of Indian corn, together with a detail of the best method of cultivating that article.

With unfeigned respect,
I am yours,
Agricola,
North-Carolina, 1st Nov. 1836.

From the Northampton Courier.

PEA-NUT CACOONS FROM ITALY.

We have seen some cacoons of a superior quality, raised in Northampton the present year, being the product of Italian eggs, 240 of which weighed one pound—one peck of which were reeled at Northampton Silk factory, produced seven ounces of silk, of superior fibre and most brilliant lustre, being at the rate of 1¾ pounds of silk to a bushel. The cacoons were long, firm, and in the shape of a Pea-nut, having a depression or tricture mid-way of the cacoon. They were small, firm and heavy, the thread of unusual length, so much so that the reeler almost despaired of finding an end.

We have the impression that the worms were fed on the Canton mulberry. We understand the demand for, and sales of mulberry trees and cuttings this fall is unprecedented. We approve of the removal of the trees to the place of destination, before

winter, that they may be ready for setting next spring, and avoid exposure to the spring frosts and drying winds. Trees and cuttings should be set immediately after being removed from the place of deposite.

The present prospect is, that the silk growing business will be prosecuted with more energy the next, than in any preceding year; an impulse has been given, that cannot be easily checked or paralysed. It is hoped that the few individuals who have thoroughly investigated and tested the mulberry culture, will not relax their exertions to acquire and communicate practical and useful information on the subject of silk culture, but that they will persevere until a mulberry patch shall be planted, and found as common about every mansion in the country village and cabin of the forest, as is the currant bush in our gardens.

It has been proved by actual experiment that worms may be fed on the foliage of the Chinese mulberry the same year the plants or cuttings are set out, with evident benefit to the plant, producing more foliage, and may be plucked the same season, always leaving the leading shoots untouched until the last collection of the foliage, and then take off the leading shoots to facilitate and promote the formation of wood.

From the Farmers' Register.

COMPARATIVE VALUE OF APPLES, TO FEED STOCK, AND FOR SALE, AND THEIR PRODUCTS, CIDER AND BRANDY.

NOVEMBER 4, 1836.

During the two last summers and falls, my duties called me into the apple regions of the north. The following facts were obtained, in reference to the subject of apple cider and brandy.

1. Cider drinkers are peculiarly subject to rheumatism, to inflamed eyelids, to headache, bleeding at the nose, to sores and ulcers, difficult and tedious to cure, to affections of the stomach and bowels, and to premature trembling of the hand and head.

2. Cider drunkards are the most brutish and crnel of the unhappy tribe of inebriates.

3. An old orchard and a distillery, are almost invariably indices of widows, orphans, poverty and drunkenness.

4. There is a great loss of money in making either cider or brandy. Good eating apples are worth on an average 25 cents a bushel. Eight bushels of apples make a barrel of cider, and twelve barrels of cider make one barrel of brandy. Brandy at 50 cents per gallon would give about 15 cents per bushel for the apples. The loss is ten cents per bushel. This, on an orchard of one hundred trees, in ten years, would be over one thousand dollars! No allowance is made for capital and labor connected with distilling. Take these into consideration, and the loss is much greater.

5. It costs no more to raise good apples suitable for market, than to raise apples only suitable for distilling. Very often apples are worth one dollar per bushel, and then the loss is immense, by turning them into brandy.—I am told that in Mobile, apples sell now for ten dollars a barrel.

6. Engrafting and budding will change the character of an orchard, and more than compensate for the time and amount lost in producing the change, in ten years.

7. Apples make most excellent food for horses. Several physicians of extensive practice, in Connecticut and Massachusetts feed their horses on apples and hay. I have never seen fatter horses—more sleek and spirited. The hair is much more lively, and requires less grooming than that of horses fed on grain. Mr. Norton of Farmington, Connecticut, has about the finest pair of hosres I have seen. They are fed mainly on apples and hay. They travel very fast and seem to have both wind and bottom. It is proper, however, to remark, that not as much grain is given to horses at the north, as is customary at the south. One thing is worth noticing—horses fed on apples do not eat as much hay as when they are fed on grain. Very sour raw apples injure the teeth of horses; but when boiled they do not.—The rule of feeding is to commence with a small quantity and gradually increase to a bushel a day, for one horse.

8. Apples are most excellent food for beeves. The fattest beef I have seen, was made so on sweet apples.

9. Nothing will fatten mutton quicker than apples. It is necessary, or best, to cut up the apples when fed to sheep.

10. Hogs care nothing for corn if they can get apples: if sweet, the apples may be given without boiling: if sour, they must be boiled. Mixed with corn meal the flesh is firmer.

11. Apples increase the quantity and quality of milk. At first there was a prejudice against giving apples to milch cows; because it was thought they diminished or dried up the milk. It is true, that a *gorge* of apples, or any other green food, will cause a fever, and dry up the milk; but given in proper quantities, the effect is quite different.

12. Cattle and hogs are purchased and fattened on apples, and sold at a fine profit, when to fatten them on corn would ensure a loss.

13. Sweet apples and good eating apples are to be preferred as food for horses, sheep, and cows: also for hogs; though some recommend a mixture of sour and sweet for hogs.

If these remarks shall induce any one to test their correctness, by making a fair experiment, the object of my writing them will be fully answered.

THOMAS P. HUNT.

IMPROVEMENT OF COFFEE.—Many things have been proposed as substitutes for Coffee. Rye, and other grain, beans, peas, chicory, beets dried, &c. have in turn been proposed and their qualities valued. For some years past there has been sold in Paris, under the pompous name of *Coffee flowers imported from America*, a dark powder, a pinch of which really communicates to coffee a very agreeable aroma and allows of a little diminution of the quantity. I have examined this powder, and find it to be only sugar caromelized, or rather, almost completely chared. A small quantity of caromel produces precisely the same effect.

Chesnuts deprived of the envelope, cut into fragments of the size of coffee grains, fried and mixed with real coffee, roasted and ground together, are the best substitutes I have found. I have used it for thirty years. Some mix them in equal proportions.—[Bodin De La Pichonnerie.]

SUPPOSED NEW PLANET.—On the 15th of February, M. Arago read to the Academy of Sciences an extract of a letter from M. Cacciatore, Astronomer at Palermo, to Capt. Smyth. The Sicilian Astronomer announces in this letter, that he saw in the month of May, 1835, near the 17th star, of the 12th hour of the Catalogue of Piazzi, (right ascension 181° 30′, and southern declination 4° 45′,) another star of the 7th or 8th magnitude. Having taken the distance of the two stars, he found that in three days the distance had increased.—The motion of the star was about ten seconds of right ascension on the eastern side, and a minute or a little less towards the north. In consequence of the state of the weather, he could not succeed in tracing it. From the slowness of its motion, he conceives it must be situated beyond Herschel.—[Bib. Univ. Jan. 1836—Rec. Gen. Sc. June, 1836.]

CIRCULAR.

PHILADELPHIA, November, 1836.

SIR—I take the liberty of informing you, that, within a few months past, I have perfected several very valuable improvements in the Locomotive Steam Engine, which have given better results than have ever been obtained by the best Locomotives in Europe or America, and respectfully call your attention to the following extracts, viz.:

From the Railroad Journal, New-York, July 16, 1836.

"LOCOMOTIVE ENGINES ON INCLINED PLANES.—The Locomotive Steam Engine, 'GEORGE WASHINGTON,' made for the State of Pennsylvania, by William Norris, of Philadelphia, was placed on the Columbia and Philadelphia Railroad, on Saturday afternoon, the 9th instant. On the following morning, her powers were tested, in ascending the Inclined Plane near Philadelphia. This plane is 2800 feet in length, with an ascent in that distance of 196 feet, or at the rate of 369 feet to the mile, or 7 feet rise in 100 feet, or 1 foot in 14. The weight of the Engine is 14,930 lbs. only. The load attached weighed 19,200 lbs. including the weight of 24 persons who were on the Tender and Burthen Car. The Engine started immediately at the base, without a running start, and dragged up said load of 19,200 lbs. the above distance of 2800 feet, in the space of two minutes and one second, or at the rate of 15¼ miles per hour; pressure on the boiler a fraction under 60 lbs. to the square inch. The Engine then descended the plane with the same load at various speed, frequently stopping to test the security, the valves being reversed, or set for going ahead; and when it was desired to stop altogether, the steam was let on very slowly, which brought her to a dead stand for a second or two,

when she would immediately start up the grade. In this way, stopping and starting at pleasure, the time occupied in descending the 2800 feet, was from 12 to 15 minutes; thus testing the perfect security of her performance on the plane. She again ascended the plane with the same load and took her place on the road, the same morning, ready for use."

From the Pennsylvania Inquirer, July 21.

"IMPORTANT IMPROVEMENT.—THE GEORGE WASHINGTON LOCOMOTIVE.—We invite attention to the following. It notices an improvement of a most important character. A friend, who enjoyed the pleasure of an excursion in a car drawn by this new locomotive, speaks of her beauty and power in the most enthusiastic terms. We trust that some correspondent, acquainted with the subject, who has had an opportunity of examining the GEORGE WASHINGTON, will furnish a detailed account of this new and important improvement.

"FROM THE UNITED STATES GAZETTE.—'Mr. Chandler—The undesigned was yesterday one of a party of about fifty gentlemen, who met at the invitation of Mr. William Norris, to be witnesses to the success of an experiment, which, as the consequences will be of almost incalculable benefit to the public in general, I will endeavor to give you an account of.

"'We assembled at 4 o'clock, A. M., and proceeded to the foot of the inclined plane on the Columbia Railroad, near the Schuylkill, where we found Mr. Norris's new Locomotive Engine, the 'GEORGE WASHINGTON,' in waiting for us, to test her powers in taking us up the plane without assistance from the stationary power.

"'We started, ascending most majestically the whole distance of 935 yards in 2 minutes and 23 seconds, being at the rate of a mile in 4½ minutes, thereby showing to the world that, thanks to Mr. Norris, the enormous expense of stationary engines on Railroads was no longer necessary.

"'We were unable to ascertain the exact weight of two of the passenger cars, but estimating three tons each, would make our whole weight fourteen tons, and that calculation is believed to be below the mark; the rise in the plane is 7 feet in every 100 feet, or 1 foot in 14⅔ feet; and the greatest power that has ever been before attained, was, in England, to ascend without any extra weight, 1 foot in 60 feet, and in America, 1 foot in 42 feet. Very little reflection will convince every one of the great importance of Mr. Norris's recent discovery or improvement.

"'The company, amongst whom were several gentlemen of distinguiseed talents, Messrs. Campbell and Roberts, engineers, Mr. Ortlip, superintendent, Mr. Smith, commissioner, Messrs. Minor and Schaeffer, from New-York, Mr. Schwartz, from Paris, &c. &c., breakfasted at the Paoli, and proceeded to Lancaster to dine and celebrate the event.

"'After dinner, it being understood that his Excellency, Governor Ritner, was in the town of Lancaster, and his engagements not allowing of coming all the way to Philadelphia, he accepted an invitation from Mr. Norris, to take a short excursion on the road, for the purpose of seeing the powers of the engine; and judging by his manner and expressions, his gratification must have been more than ordinary.

"'We returned to the city about 8 o'clock in the evening, convinced of the success of our host, Mr. Norris, and having, in the language of one of our party, lived six days in one.'"

From the National Gazette, July 21.

"On Tuesday, the 19th instant, a Locomotive Engine, manufactured by Mr. William Norris, of this city, ascended the Inclined Plane on the Columbia Railroad, drawing with great ease her Tender, and two Passenger Cars, with 53 passengers. Any thing approaching this result has never been attained hitherto, either in England or this country.

"The length of the plane is 2800 feet, the grade 369 feet to the mile, or an ascent of 196 feet in the length of the plane.—The experiment was tried at a very early hour in the morning, while the rails were wet with dew, and of course not in the most favorable condition. The time occupied in passing from the level at the base, to that at the top of the plane, was 2 minutes and 24 seconds. The experiment was witnessed by many scientific gentlemen, among whom the opinion was general, that the improvement of Mr. Norris promises a most important reduction in the expense hitherto attending the transportation on inclined planes. The weight of the Engine with water, 14,930 lbs.; load dragged on the plane, including tender and fuel, cars and passengers, 31,270 lbs. Pressure under 80 lbs. to square inch. It is remarkable that the Engine was blowing off, on her arrival at the top, having acquired speed and power during the ascent."

From the Railroad Journal, New-York, July 30

"EXCURSION TO PHILADELPHIA, AND REMARKABLE PERFORMANCE OF THE LOCOMOTIVE 'GEORGE WASHINGTON.'—In pursuance of our request, Mr. Norris made arrangements with the commissioners of the Columbia Railroad, for the use of his locomotive. Tuesday, July the 19th, was the day appointed for the trial. We left here on Monday afternoon, at 4 o'clock, accompanied by Mr. George N. Miner, of this city, Mr. Theodore Schwartz, of Paris, and Messrs. Elliot and Betts, of Alabama. Mr. Schwartz, who was to sail for Europe the next day, gladly made the trip, with a view to carry home his own testimony as an eye witness. Our journey over the Camden and Amboy, and Trenton and Philadelphia Railroads was highly interesting, and the conversation of that evening will long be remembered with pleasure. We arrived at Philadelphia about midnight and after sundry mistakes and mischances succeeded in obtaining some repose. On Tuesday morning, two cars, drawn by horses, set out with a party of upwards of forty. We arrived at the foot of the inclined plane before 6 o'clock, while the rails were yet quite wet with dew. On our arrival, it was found that, owing to accident or design, while the fire was burning, the water had been blown out of the boiler so as to endanger the tubes. The result was a leakage of some consequence during the day. The Engine started at the foot of the plane and on the plane. After proceeding a few feet, the wheels were found to slip, and the Engine returned. It was said that the rails were found to have been *oiled* at this place; a small quantity of sand was strown over the spot, and the Engine again proceeded. She regularly and steadily gained speed as she advanced to the very top, passing over the plane in 2 minutes and 24 seconds. The enthusiasm of feeling manifested cannot be described; so complete a triumph had never been obtained; the doubts that had been entertained by some, and the fears of others, were dispelled in an instant; the eager look that settled upon every one's face, gave way to that of confident success, while all present expressed their gratification in loud and repeated cheers.

"The length of the plane is 2800 feet; the grade 369 feet to the mile, or 1 foot rise in 14.3 feet, which is a much steeper grade than the planes on the Mohawk and Hudson Railroad, those being 1 foot in 18 feet, making an ascent of 196 feet in 2800 feet; weight of Engine with water, 14,930 lbs.; load drawn up the plane, including weight of Tender with water and coal, two Passenger Cars and 53 passengers, 31,270 lbs.; pressure in the boiler, less than 80 lbs. to the square inch; time of running 2 minutes and 24 seconds. It is to be remembered that the rails were wet with dew. As to the oil, it was afterwards mentioned that bets were made with the workmen to a considerable amount, and those having been lost by the successful performance of the Engine on a former day, were now quadrupled, and to save themselves it is not unlikely that this means was provided to accelerate the descent rather than the ascent of the Engine. At the conclusion we shall give the dimensions of this Engine.

"The party again embarked, after examining the workshops, and proceeded to Paoli to breakfast, and thence to Lancaster, the Engine conveying at the same time a number of freight cars.

"The unfortunate location of this road is very evident; frequent and short curves are introduced so uniformly, that it would be supposed that such a location was to be preferred to a direct one. We arrived safely at Lancaster, and partook of an excellent dinner. A number of toasts were given, and conversation turned generally to the subject of internal improvement.—Mr. Roberts, engineer of the Harrisburg road, and Mr. H. R. Campbell, engineer of the Norristown, and of the West Philadelphia Railroad, were present; a number of the company were citizens of Philadelphia. After dinner, the company were presented to Governor Ritner, who was then in town. He afterwards accompanied the party some few miles from Lancaster and back again, when he left us, much gratified with his rapid journey. We returned in a large eight wheel car, a form that we much admired. The whole weight attached to the Engine (tender, &c. included,) must have been over 14 tons, if

not 15 tons. The time of running (exclusive of stoppage,) from Lancaster to the head of the Schuylkill inclined plane, was 3 hours and 11 minutes, being a distance of nearly 67 miles. This, it is to be remembered, was over a road having curvatures of less than 600 feet radius, up ascents of sometimes 45 feet per mile. On level and straight portions of the road, a velocity of 47 miles was attained. As the trip had already been protracted, this engine was obliged to leave at the head of the plane, on her return to Lancaster the same evening, and we descended by the rope.

"The following are the dimensions of the 'GEORGE WASHINGTON' Engine, of Mr. William Norris: Diameter of cylinders 10½ inches; length of stroke 17⅝ inches; number of tubes 78; outside diameter 2 inches; length 7 feet; diameter of driving wheels 4 feet; diameter of truck 30 inches. The Engine is six wheeled, having two driving wheels. Whole weight of Engine 14,930 lbs., actual weight on driving wheels 8700 lbs.

"It must be rembembered that there is no contrivance, as in some engines, for increasing the adhesion, by throwing the weight of the tender upon the engines, the axle being in front of the fire box, preventing any such arrangement. This engine, we are now informed, is making the regular trips, though a full load has not yet been obtained, on account of the scarcity of cars. The greatest load, as yet, drawn by it over the road, was 119 tons, gross weight, in 22 cars. The engineer confidently expects to draw 150 tons, at 12 or 15 miles per hour. She now usually works with 70 lbs. pressure of steam.

"The following is a list of the names of the gentlemen who were of the party:

"We, the subscribers, were present and witnessed the experiment and complete success of the 'GEORGE WASHINGTON,' in ascending the inclined plane, with a train of cars, containing 54 persons, besides engineers, firemen, &c., up the Columbia Railroad, at Philadelphia, on the 19th July, 1836.

Israel Morris,	Israel Roberts,
William Morrison,	S. Griffits Fisher,
A. M. Eastwick,	Joseph Harrison, Jun.
Franklin Peale,	R. M. Patterson,
T. E. Gubert,	Theodore Schwartz,
F. Blackburne,	E. Durand,
George R. Oat,	Townsend Smith,
Isaac P. Morris,	Frederick Vogel,
George Robbins,	Rufus Tyler,
A. W. Thompson,	Robert B. Davidson,
Frederick Gaul,	Alex'r. Krumbhaar,
William S. Otis,	D. K. Minor,
Alexander M'Clurg,	T. R. Peale,
P.B.Goddard,M.D.,	Octavius A. Norris,
J. Sidney Jones,	Joseph Oat,
Mahlon Ortlip,	James Poultney,
J. C. Cresson,	John E. Garrett,
George N. Miner,	George C. Schaeffer,
M. M. Reeve, M.D.,	H. R. Campbell,
Smith Jenkins,	Daniel Smith,
Thomas Moore,	

Walter Sims, Nashville, Tenn."

From the National Gazette, October 19.

"INCLINED PLANES.—The new Locomotive Steam Engine, 'WASHINGTON COUNTY FARMER,' built for the Commonwealth of Pennsylvania, by Mr. Norris, of this city, was placed on the Columbia Railroad, on Tuesday afternoon.

"The power of the Engine was then tested in ascending the Inclined Plane, which was performed to the complete satisfaction of numerous scientific gentlemen, invited expressly for the occasion.

"The plane is 2800 feet long, ascent in that distance 196 feet, equal to 369 feet to the mile, or 1 foot rise in 14 3/10 feet. Weight of Engine 18,170 lbs. with water included. Load drawn up, 30,116 lbs. including Tender with fuel and water, two large Passenger Cars and 39 passengers. Time of running, 3 minutes and 15 seconds, pressure in the boiler under 70 lbs.

"In descending the plane, the engineer repeatedly came to a dead stand from a great speed, and for some minutes played up and down the grade, thus proving most satisfactorily, the immeuse power of the Engine, and the perfect safety in its performance. The Engine is a master-piece of machinery and of beautiful exterior.

"The result here obtained has never been equalled by the best Engines in this country or Europe, excepting only similar performances of the 'GEORGE WASHINGTON,' an Engine by the same maker.

"The advantage of this great improvement in Locomotive Engines, is self-evident; Railroads can be constructed at much less cost than heretofore, now that engines can be procured (of the usual weight) to perform on grades of 70 feet or even 100 feet rise in the mile."

From the Pennsylvania Inquirer, October 20.

"INCLINED PLANES—MR. NORRIS'S ENGINE.—We were much gratified on Tuesday, in witnessing the new Locomotive Steam Engine, built by Mr. Norris, of this city, for the commonwealth of Pennsylvania. It ascended the Inclined Plane in admirable style, and performed, to the entire satisfaction of a numerous party of scientific and other gentlemen who were present.

"In order that our readers may fully understand the nature of the ascent, we annex the following statistics of the Inclined Plane: length, 2800 feet; ascent, 196 feet.

"The above ascent is equal to 369 feet in a mile, and is a rise of 1 foot in 14 3/10 feet.

"The Engine, which is called the 'WASHINGTON COUNTY FARMER,' weighs 18,170 lbs. The load drawn up, including fuel and water, two large Passenger Cars, with 29 passengers, weighed 30,116 pounds. The pressure in the boiler was under 70 lbs., and the ascent occupied 3 minutes and 15 seconds.

"In descending the plane, the engineer caused the Engine to stop suddenly several times, though previously going at great speed; and he twice moved the Engine up and down the Inclined Plane at pleasure; thus showing at once its great power and safety."

The "GEORGE WASHINGTON" has been, since July 19th, performing daily over the Columbia Railroad, length 82 miles, with trains of from 18 to 25 cars, frequently making two trips per day, and in some instances three trips in 21 hours. The largest number of Cars, in one train, drawn by this Engine over the road, has been 35; 18 loaded, 3 half loaded, and 14 empty, making a load of 128 tons, which was performed in the usual running time of 12 miles per hour. The greatest load drawn by this Engine, has been 137 tons, in 27 cars.

The "WASHINGTON COUNTY FARMER" is now in successful operation; the first load drawn by her over the road, consisted of 28 loaded cars, weighing 141¾ tons.—The ascents in this road are very heavy; the least being 28 feet rise per mile, the majority 32 feet and the greatest 47 feet. This Engine, with the load of 141¾ tons, passed over the steep ascent of 47 feet per mile, which is upwards of three-fourths of a mile long, at the unprecedented rate of 22 *miles* per hour.

I have just completed extensive buildings and workshops, and am prepared to execute orders for Locomotive Engines, with despatch, all of which shall have my late improvements, and are warranted to be made of the best materials and superior workmanship.

WILLIAM NORRIS, *Philadelphia.*